Vol. 906 Number 4

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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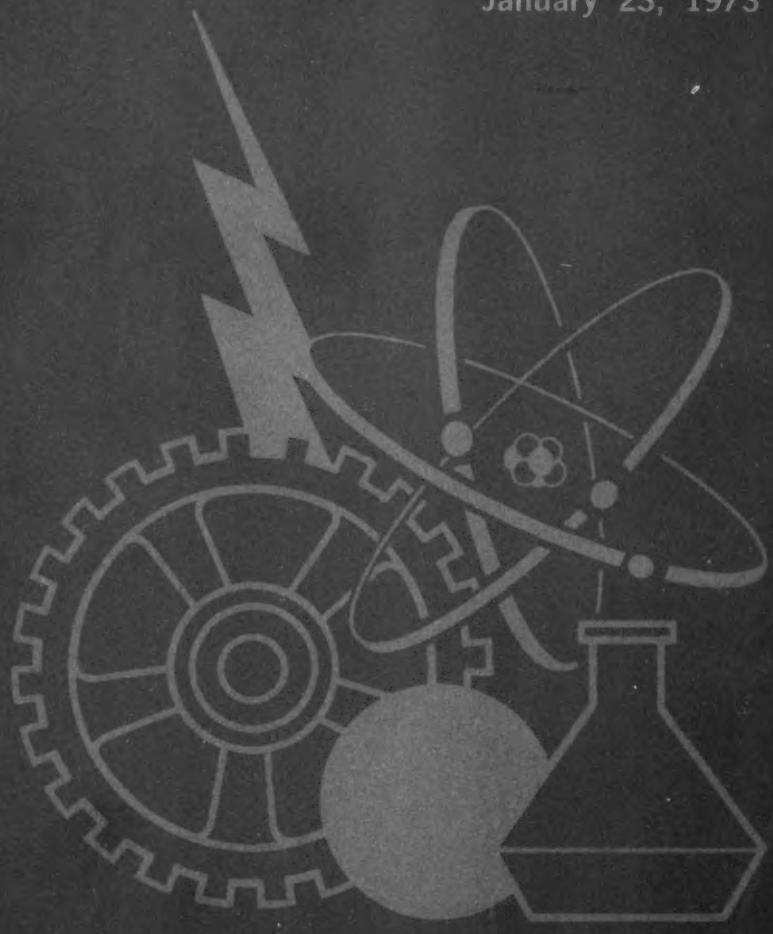
PATENTS

January 23, 1973



U. S. DEPARTMENT OF COMMERCE

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

January 23, 1973 Volume 906 Number 4

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PATENT NOTICES

Certificates of Correction for the Week of Jan. 23, 1973

Re. 27,343	3,650,345	3,678,052	3,685,437
Re. 27,399	3,651,395	3,678,284	3,685,508
Re. 27,442	3,652,499	3,678,359	3,685,722
D. 224,118	3,652,533	3,678,465	3,685,917
3,435,004	3,652,573	3,678,894	3,685,939
3,440,054	3,652,904	3,679,315	3,686,038
3,479,111	3,654,524	3,679,380	3,686,107
3,539,484	3,656,377	3,679,608	3,686,146
3,539,875	3,657,421	3,679,666	3,686,329
3,539,972	3,659,366	3,679,723	3,686,369
3,544,853	3,659,660	3,679,731	3,686,399
3,565,750	3,661,204	3,680,792	3,686,410
3,582,335	3,661,526	3,680,861	3,686,452
3,584,734	3,662,240	3,680,949	3,686,683
3,589,583	3,663,399	3,680,966	3,686,727
3,593,032	3,665,076	3,681,002	3,686,829
3,595,395	3,665,079	3,681,023	3,686,836
3,595,725	3,665,488	3,681,033	3,686,896
3,598,470	3,665,686	3,681,087	3,686,910
3,602,677	3,666,262	3,681,267	3,687,222
3,614,999	3,666,477	3,681,297	3,687,505
3,616,350	3,666,834	3,681,480	3,687,626
3,617,867	3,668,526	3,681,511	3,687,938
3,619,017	3,669,907	3,681,624	3,687,992
3,621,112	3,670,724	3,681,737	3,688,070
3,624,060	3,671,476	3,681,781	3,688,163
3,624,611	3,672,923	3,682,084	3,688,452
3,625,752	3,673,118	3,682,173	3,688,926
3,625,795	3,673,189	3,682,181	3,689,038
3,627,692	3,673,214	3,682,247	3,689,212
3,627,889	3,673,690	3,682,552	3,689,265
3,628,265	3,674,627	3,682,667	3,689,348
3,630,018	3,674,670	3,682,760	3,689,429
3,631,238	3,674,893	3,682,781	3,689,484
3,632,466	3,675,053	3,682,791	3,689,508
3,632,577	3,675,271	3,682,806	3,689,531
3,634,627	3,675,653	3,683,050	3,689,562
3,636,038	3,676,127	3,683,060	3,689,722
3,637,412	3,676,279	3,683,478	3,689,733
3,637,770	3,676,385	3,683,749	3,689,796
3,637,990	3,676,397	3,684,067	3,689,819
3,639,334	3,676,445	3,684,346	3,690,172
3,639,506	3,676,698	3,684,396	3,690,180
3,640,749	3,676,706	3,684,658	3,690,192
3,646,085	3,676,734	3,684,675	3,690,221
3,646,548	3,676,964	3,684,720	3,690,377
3,646,571	3,677,342	3,684,748	3,690,500
3,648,196	3,677,917	3,684,754	3,690,794
3,649,543	3,677,943	3,685,214	3,692,144
3,650,336	3,678,020	3,685,345	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 9, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-02-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-12-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-01-72
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-17-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-06-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-14-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	4-29-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-01-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-01-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-22-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-04-71

Expiration of patents: The patents within the range of numbers indicated below expire during January 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,728,913 to 2,733,438, inclusive
Plant Patents..... Numbers 1,442 to 1,455, inclusive

REISSUES

JANUARY 23, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

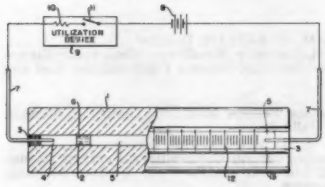
27,556
OPERATING TIME INDICATOR

Lester Corrsin, Mount Kisco, N.Y., assignor to Curtis Instruments, Inc., Mount Kisco, N.Y.

Original No. 3,045,178, dated July 17, 1962, Ser. No. 760,897, Sept. 15, 1958. Application for reissue Nov. 8, 1971, Ser. No. 196,617

Int. Cl. G04f *9/00*; G01r *11/44*

U.S. Cl. 324—182 18 Claims



[1. An operating time indicator comprising a body of non-conductive material having a bore of substantially uniform cross-section through the body, said bore having therein two columns of liquid metal, each of which extends from an end of the bore toward the other column such that a space not occupied by column metal exists between the adjacent ends of said columns, a liquid electrolyte in said bore and in contact with the inmost ends of the columns and filling said space between the adjacent ends of said columns, said electrolyte comprising principally a solution of at least one soluble salt of said metal, and conductive means for connecting said columns to an external source of potential, whereby, upon impressing a potential between said columns, metal is removed from one of said columns and transported through said electrolyte and deposited on the other of said columns, the change of length of said columns being directly indicative of the quantity of electric charge flowing through said indicator.]

27,557
SEQUENTIAL SWITCHING CIRCUIT BREAKER FOR HIGH POWER AC OR DC POWER TRANSMISSION CIRCUITS

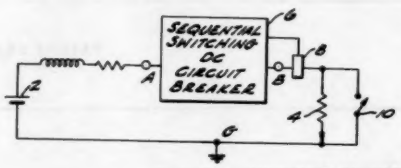
Kenneth T. Lian, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Original No. 3,534,226, dated Oct. 13, 1970, Ser. No. 681,632, Nov. 9, 1967. Application for reissue Sept. 9, 1971, Ser. No. 178,994

Int. Cl. H01h *9/34*; H02h *7/22*

U.S. Cl. 317—11 A 9 Claims

An arrangement of series connected switches and resistors is paralleled across the contacts of a mechanical interrupter which is inserted into the line to be protected. In normal operation, all switches are closed. Upon the occurrence of a circuit fault, the interrupter contacts begin to separate and this initiates the sequential opening of the switches. These switches open such that an increasingly larger resistance is inserted in series with the transmission line. Sequential switching devices can also be used to connect power to a load.



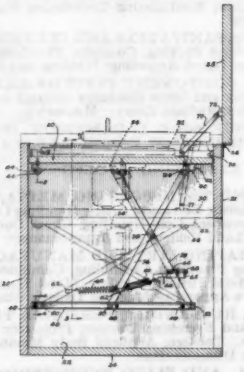
27,558
PLATFORM ELEVATION CONTROL MECHANISM

Malcolm T. Phelps and Carl H. Little, Jamestown, N.Y., assignors to Weber-Knapp Company, Jamestown, N.Y.

Original No. 3,431,040, dated Mar. 4, 1969, Ser. No. 662,405, Aug. 22, 1967. Application for reissue Apr. 23, 1969, Ser. No. 822,071

Int. Cl. A47b *97/00, 81/00*; C11b *1/00*

U.S. Cl. 312—272 9 Claims

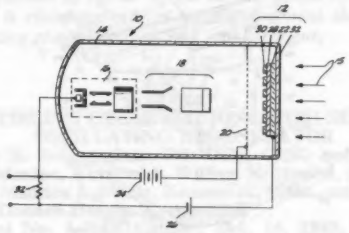


An improved platform elevation control mechanism which is particularly adapted to control the raising and lowering of a platform in a record player cabinet or the like wherein the cabinet includes a swinging top cover or lid and wherein the platform carries the weight of the record player mechanism and records, and other accessories such as the tuner, amplifier, etc.; and wherein the platform rises and lowers in response to manual movements of the cabinet cover.

27,559
IMAGE TRANSDUCING SYSTEM EMPLOYING REVERSE BIASED JUNCTION DIODES

Paul H. Wendland, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Original No. 3,423,623, dated Jan. 21, 1969, Ser. No. 580,962, Sept. 21, 1966. Application for reissue Apr. 8, 1970, Ser. No. 132,470
Int. Cl. H01j *29/39, 31/26*
U.S. Cl. 315—10 22 Claims

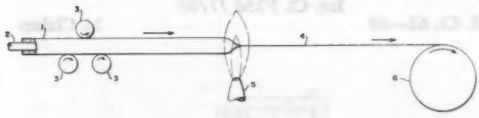


A target for a vidicon camera tube comprising an N-type semiconductor member having a resistivity between 0.01 and 0.1 ohm-cm. and a plurality of discrete junctions on the side of the target member which is to be scanned by an electron beam.

27,560
DEVITRIFICATION OF THE CORE OF A COAXIAL GLASS FIBER

Claude Achener, Paris, France, assignor to Quartz & Silice, S.A., Paris, France

Original No. 3,589,878, dated June 29, 1971, Ser. No. 758,778, Sept. 10, 1968. Application for reissue Oct. 1, 1971, Ser. No. 185,918
Claims priority, application France, Sept. 15, 1967, 121,199
Int. Cl. C03c *25/02, 15/00*
U.S. Cl. 65—3 4 Claims



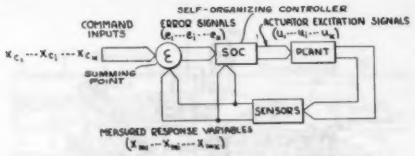
Filaments consisting of a core of devitrified glass surrounded by a layer of glass in compression. The method of producing those filaments comprising drawing them from a layer of silica glass fused to a core of devitrifiable glass and heating the drawn filaments at a temperature that will devitrify the devitrifiable glass without deforming the silica glass.

27,561
SELF-ORGANIZING CONTROL SYSTEM FOR PROVIDING MULTIPLE-GOAL, MULTIPLE-ACTUATOR CONTROL

Roger L. Barron, Burke, Va., assignor to Adaptronics, Inc., McLean, Va.

Original No. 3,519,998, dated July 7, 1970, Ser. No. 671,743, Sept. 29, 1967, which is a continuation-in-part of Ser. No. 565,162, July 14, 1966. Application for reissue Jan. 5, 1971, Ser. No. 104,184
Int. Cl. G05b *13/00*
U.S. Cl. 340—172.5 12 Claims

The disclosure relates to a self-organizing control system capable of accomplishing simultaneous, multiple-goal, multiple-actuator control of a plant in which the instantaneous influence of each actuator on multiple system error signals is identified and the self-organizing con-

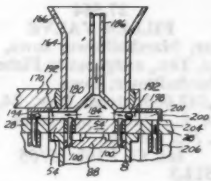


troller compensates for changing polarities of actuator effects, both direct and cross-coupled. The control is provided using pulse density coding techniques.

27,562
POWDER COMPACTING PRESS

Joseph E. Smith, Birmingham, Mich., assignor to Wolverine-Pentronix, Inc.

Original No. 3,561,054, dated Feb. 9, 1971, Ser. No. 772,291, Oct. 31, 1968. Application for reissue June 14, 1971, Ser. No. 153,004
Int. Cl. B30b *11/02, 15/32*
U.S. Cl. 425—78 26 Claims



A combined hopper and rotatable positioner assembly for a powder compacting press adapted to be pivotally positioned above a compression die provided with die cavities, the hopper being rotatable and provided with a base overlying said die, the base having alternating apertures, grooves and land sections in equal number corresponding to the number of die cavities and rotational drive means to rotate the hopper in timed sequence to alternately position the apertures, grooves and land sections over said die cavities.

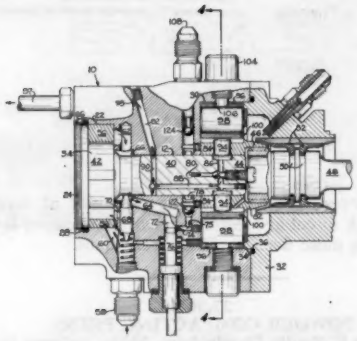
27,563
FUEL PUMP

Vernon D. Roosa, Hartford, Conn., assignor to Stanadyne, Inc., Wilson, Conn.

Original No. 3,204,561, dated Sept. 7, 1965, Ser. No. 222,553, Sept. 10, 1962. Application for reissue Feb. 1, 1971, Ser. No. 111,562
Int. Cl. F04b *19/02*
U.S. Cl. 417—462 14 Claims

1. A fuel pump comprising a casing having inlet and outlet passages, a bore in said casing, a fuel distributing rotor [positioned] *journaled* in said bore and *defining with said bore an annulus intermediate the ends of said bore for receiving fuel from the inlet passage of said casings, said rotor* having fuel inlet port means adapted to communicate with said [inlet passage] *annulus* and outlet ports means adapted to communicate in sequence during the rotation of said rotor with said outlet passages of said casing to permit alternate admission and discharge of fuel from the interior of said rotor, piston means carried

by said rotor and operable in response to the rotation thereof to receive fuel from the inlet port means and to eject fuel to said outlet port means, and means carried

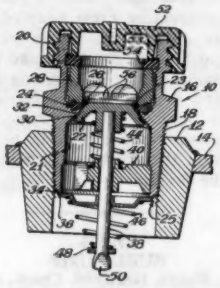


by said rotor and positioned between said inlet port means and said piston means to prevent the reverse flow of fuel therethrough.

27,564
FILLER VALVE

William A. Etter, Marshalltown, Iowa, and Wendell L. Seaman, Allen, Tex., assignors to Fisher Controls Company, Inc., Marshalltown, Iowa

Original No. 3,542,063, dated Nov. 24, 1970, Ser. No. 735,106, June 6, 1968. Application for reissue July 21, 1971, Ser. No. 165,795
Int. Cl. F16k *15/06*
U.S. Cl. 137—512.3 **7 Claims**

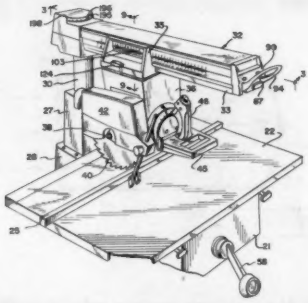


A filler valve for a pressure container provided with a first seating means comprising a replaceable valve seat and a fixed valve seat. A first valve member carried on a valve stem is adapted to normally seat against the replaceable valve seat, however, when the replaceable valve seat is removed for repair or replacement, the first valve member seats against the second valve seat. The valve stem is elongated and carries a second valve member thereon adapted to seat against second seating means. The valve stem is constructed and arranged to permit long travel of the second valve member on the valve stem to provide improved flow capacity and spray filling of the pressure container.

27,565
RADIAL ARM SAW

Harold R. Botefuhr, Bensenville, Ill., assignor to McGraw-Edison Company

Original No. 3,482,610, dated Dec. 9, 1969, Ser. No. 594,084, Nov. 14, 1966. Application for reissue Aug. 13, 1970, Ser. No. 63,558
Int. Cl. B27b *27/06*; B26d *5/08*
U.S. Cl. 143—6 A **5 Claims**

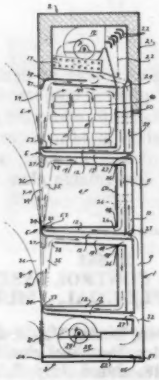


A radial arm saw is provided with a column having a radial arm for supporting a motor driven saw over a work surface. A pair of concentrically mounted actuator means are provided through the radial arm for adjusting the position of the arm relative to a vertical plane containing the vertical axis of the column. One actuator operates a means for setting the arm in one of several preselected angular positions. The other actuator operates to lock the arm in any one of an infinite number of angular positions.

27,566
AIR CONDITIONED DISPLAY COMPARTMENT AND METHOD

Edward W. Simons, Mill Valley, Calif., assignor to Dualjet Corporation

Original No. 2,862,369, dated Dec. 2, 1958, Ser. No. 607,112, Aug. 30, 1956. Application for reissue Sept. 28, 1971, Ser. No. 184,643
Int. Cl. F25d *17/06*
U.S. Cl. 62—89 **14 Claims**



A refrigerated upright display case comprising a walled compartment having a generally vertical, open side defined by a pair of spaced, opposed edges, a pair of side-by-side nozzles extending along one of said edges for issuing parallel, contacting curtains of air across said

open side, a pair of fans for generating said curtains respectively connected to said nozzles by a pair of conduits, refrigerating means for refrigerating the air circulated by the one of said fans connected to the one of said nozzles adjacent the interior of said compartments, and a return conduit extending along the other of said edges for receiving the curtain issued from said one nozzle and conducting it to said one fan, the conduit connecting said one fan and said one nozzle and said return conduit extending around and in contact with the walls of said compartment and a portion of the air of the curtain issued by said one nozzle is circulated within the compartment thereby refrigerating the interior of said compartment.

27,567
STIRLING CYCLE MACHINE WITH SELF-OSCILLATING REGENERATOR

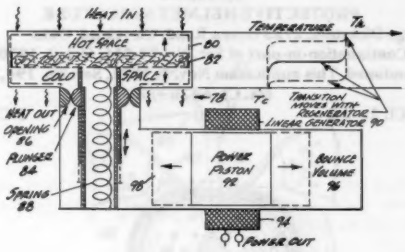
Arthur R. Baumgardner, Fair Oaks, Calif., and Richard P. Johnston, Kennewick, William R. Martini, Richland, and Maurice A. White, Kennewick, Wash., assignors to McDonnell Douglas Corporation

Original No. 3,484,616, dated Dec. 16, 1969, Ser. No. 702,420, Feb. 1, 1968. Application for reissue Mar. 31, 1971, Ser. No. 130,042

Int. Cl. H02p *9/04;* **F02g** *1/04*

U.S. Cl. 290—1 **13 Claims**

Constant volume regenerative, or Stirling, cycle thermal machine having a self-oscillating regenerator. Regenerator is supported by spring adapted to be attached to fixed structure, and includes a porous, high heat storage capacity, matrix positioned between two thin orfiice plates. The orifice plates have many small holes which



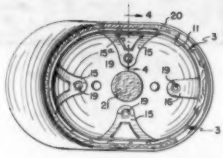
cause the working fluid of machine passing through the matrix to jet against the heating and cooling walls thereof to enhance heat transfer between working fluid and the walls.

PATENTS

GRANTED JANUARY 23, 1973

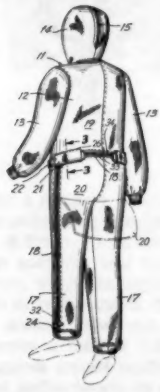
GENERAL AND MECHANICAL

3,711,864
PROTECTIVE HELMET STRUCTURE
George Dickstein, 2723 Green Road, Cleveland, Ohio
Continuation-in-part of Ser. No. 77,516, Oct. 2, 1970, abandoned. This application Nov. 1, 1971, Ser. No. 194,249
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 R **3 Claims**



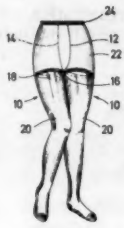
A protective helmet of hard thermoplastic synthetic resin is provided with a flexible harness having a sweatband strap extending around the inside of the crown at the lower edge of the crown with a plurality of integral projecting portions extending upwardly and inwardly from the strap toward the center of the crown. At the terminal end of each of the projecting portions there is provided an integral outwardly protruding generally cylindrical hollow cup which opens inwardly and which has a through opening in the bottom of the cup of a smaller diameter than the inside diameter of the cup. A plurality of inwardly extending studs integral with the crown pass, one through each of the openings of the cups. Friction may be relied upon to hold the cups in place or heat may be applied to the end of the stud inside of the receiving cup to expand the end of the stud and hold the harness more firmly to the helmet.

3,711,865
GARMENT
Henry Schifman, Far Rockaway, N.Y., assignor to Refrigwear, Inc., Inwood, N.J.
Filed Jan. 21, 1971, Ser. No. 108,654
Int. Cl. A41d *13/02*
U.S. Cl. 2—79 **2 Claims**



A garment especially suitable for wear as an outer garment during cold weather, which can be opened along the legs for ease of entry and removal and which can be opened along the backside to permit the wearer to perform necessary bodily functions. A continuous zipper closure permits the dual functional operation with the closure extending transversely of the garment at the back portion thereof being covered to prevent visual exposure with the cover portion being held in operative position by a body-encircling belt.

3,711,866
METHOD AND APPARATUS FOR PRODUCING PANTY HOSE
Fritz Vorberg, Bischofswiesen-Winkl, Germany, assignor to Globotex AG, Zug, Switzerland
Filed Feb. 10, 1969, Ser. No. 797,845
Int. Cl. A41b *9/04*; **D05b** *3/00*
U.S. Cl. 2—224 R **6 Claims**

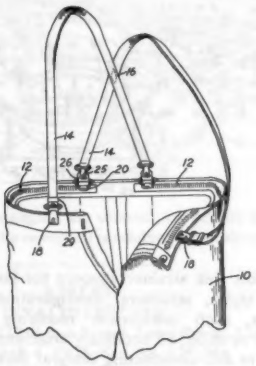


The invention relates to a method of producing panty hose in which in a first step two hip length stockings are knitted for each panty hose, which are then drawn over shaped forms as usually used for boarding or plasticizing stockings, after the plasticizing and dyeing operation while the stockings are still on the shaped forms, being arranged side-by-side upright or in a horizontal position those portions of the stockings providing the hip portions of the finished panty hose are drawn together and sewed together in such a manner, that first and second portions of a seam are produced the first one lying on the front side and the second one lying on the rear side of the finished panty hose; therefore the pitting between said seam portions can be cut through, preferably while the stockings are still arranged on said shaped forms.

3,711,867
TROUSER-SUSPENDER CONNECTING TROLLEY MEANS FOR TOILET CONVENIENCE
John L. Mott, P. O. Box 1106, Grants Pass, Oreg.
Filed Aug. 24, 1971, Ser. No. 174,341
Int. Cl. A41d *1/06*, *13/02*
U.S. Cl. 2—230 **7 Claims**

A novel trouser and suspender connecting device is provided, adapted for mounting in the waist portion of trousers to extend uninterruptedly from rear to front thereof for the convenience of persons who wear one or more outer garments over suspenders, and who are required to let the trousers down at the rear in order to satisfy toilet needs. The device may advantageously consist of flexible trolley means, fixedly connected along the waist portion of the trousers, slide means inseparably but movably associated with the trolley means, and a member carried by, and forming part of each slide means which is adapted for separable attachment to the rear

end of a suspender member. In the absence of an outer suspender covering garment, the wearer of suspender supported trousers has the usual options of sliding the suspenders off the shoulders or of detaching the suspenders from the trousers at the rear. A person wearing a trouser and suspender combination utilizing my novel trolley device has these options, but if he also wears an outer garment or garments, he has the further, highly advantageous option of merely sliding the rear ends of the suspenders around one or both hips from rear to front without detaching the suspenders from the trousers. There is then no need to fish and fumble for the rear ends of the suspenders under the outer garment.



3,711,868

WAISTBAND FOR TROUSERS, SKIRTS AND THE LIKE

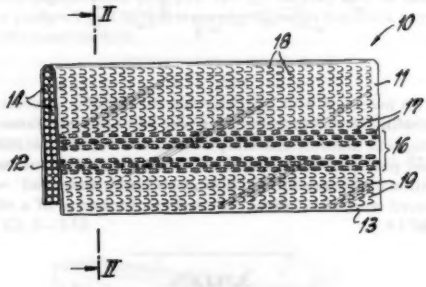
Herbert Kristof, Schuetzenstr. 29, 4791 Schlangen, Germany

Filed Dec. 14, 1970, Ser. No. 97,683

Claims priority, application Germany, Dec. 13, 1969, P 19 62 599.1

Int. Cl. A41d *1/06*

U.S. Cl. 2—237 **3 Claims**



A waistband for trousers, skirts and the like is composed of an elongated outer layer of woven or knitted fabric having opposite sides and two transversely spaced longitudinally extending edges. An elongated reinforcing layer of a different woven or knitted fabric is superimposed in surface-to-surface relationship upon one of the sides of the elongated outer layer and is unitary therewith along at least one of the longitudinally extending edges thereof. The layers may also be unitary over their entire juxtaposed surface areas, and the other exposed side of the outer layer may be provided with a raised strip composed of anti-slip filaments which are woven into the material of the outer layer and may form patterns.

3,711,869

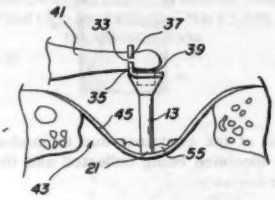
PROSTHESIS FOR THE INNER EAR

John J. Shea, Jr., Memphis, Tenn., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Filed Aug. 27, 1970, Ser. No. 67,405

Int. Cl. A61f *1/24, 1/18*

U.S. Cl. 3—1 **7 Claims**



Prosthesis for use in otologic surgery in the middle ear to replace the stapes and attach to the undersurface of the lenticular process of the incus. The prosthesis is formed from "Teflon" and includes an elongated piston member, a head fixedly attached to the piston member having a socket therein adapted to receive the lenticular process of the incus, and a loop fixedly attached to the head for extending over the incus to hold the prosthesis in place.

3,711,870

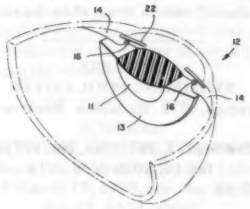
ARTIFICIAL LENS IMPLANT

Rollin E. Deitrick, 1020 Deepwood Court, Winston-Salem, N.C.

Filed Dec. 7, 1971, Ser. No. 205,626

Int. Cl. A61f *1/16, 1/24*

U.S. Cl. 3—13 **2 Claims**



A lens suitable for implantion in the eye is provided with a resilient flange and the flange is sutured to the ciliary muscle of the eye to position and retain the lens in the same position as the original lens.

3,711,871

SANITARY LIQUID SPECIMEN COLLECTOR

Michael H. Sherin, Fontana, Wis., assignor to Sage Products Inc., Elk Grove, Ill.

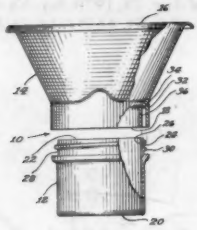
Filed Feb. 2, 1972, Ser. No. 222,912

Int. Cl. E03d *13/00*

U.S. Cl. 4—110 **6 Claims**

There is disclosed a sanitary liquid specimen collector which comprises a container having an open top end and a closed bottom end in combination with a receptacle having a first open end and a second open end. One end of the receptacle is adapted to slidably engage the open top end of the container such that a portion of the receptacle covers the top

inner surface of the container and the top outer surface of the container, thereby preventing contamination of both the

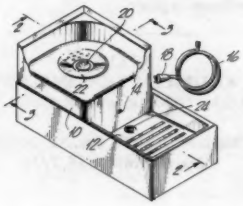


specimen and of the container due to inadvertent contact between the specimen being collected and the open ended surface of the container.

3,711,872
SIT IN SHOWER

Louis Jarosinski, Kaukauna, Wis., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 5, 1970, Ser. No. 78,084
Int. Cl. A47k *3/22*
U.S. Cl. 4—146 **3 Claims**

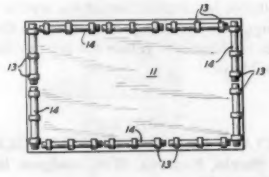


A bathing apparatus employing a raised seat with a sitz bath and a slightly raised footbath lower than the seat.

3,711,873
SWIMMING POOL COVER

Frederick Katzman, 372 Hamilton Boulevard, Piscataway, N.J.

Filed Sept. 2, 1971, Ser. No. 177,409
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.12 **10 Claims**

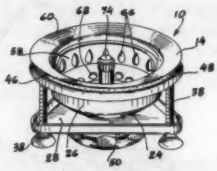


The method for and device to cover a swimming pool in which a sheet is disposed over the swimming pool, and a plurality of water filled tubes positioned on the sheet adjacent to the edge of the swimming pool to hold it down, the tubes being filled with water, and loops embracing the water filled tubes to secure the tubes in position on top of the cover.

3,711,874
BASKET SINK STRAINER

Israel Gajer, Wyandanch, N.Y., assignor to Jameco Industries, Inc., Wyandanch, N.Y.

Filed May 4, 1970, Ser. No. 34,017
Int. Cl. A47k *1/14*
U.S. Cl. 4—287 **3 Claims**

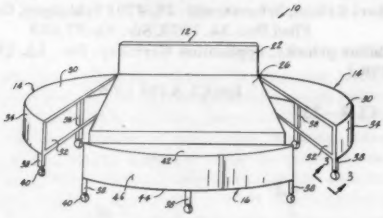


A basket sink strainer adapted for installation in sinks of various styles, structural configurations, dimensions and materials, such installation requiring no special tools, fasteners or skills, all necessary attaching means being incorporated in and constituting integral parts of the basket sink strainer assembly.

3,711,875
AUXILIARY BED FORM STRUCTURE

Betty June Cox, 3508 North Market, Wichita, Kans.

Filed Nov. 23, 1970, Ser. No. 91,862
Int. Cl. A47b *23/00*
U.S. Cl. 5—2 **5 Claims**



This invention is an auxiliary bed form usable in combination with a conventional rectangular bed having a frame and spring and mattress assembly to give the bed a substantially round planform shape. At least three structural segments are positionable adjacent to a conventional bed, and when covered with a bedspread give it the appearance of a round bed.

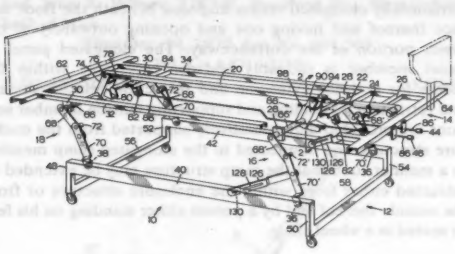
3,711,876
TILT BED

Norman Kirkland, Port Credit, Ontario, and Stanley Rachlinski, Oakville, Ontario, both of Canada, assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Feb. 16, 1972, Ser. No. 226,867
Claims priority, application Canada, May 5, 1971, 112193
Int. Cl. A61g *7/00, 7/10*
U.S. Cl. 5—62 **7 Claims**

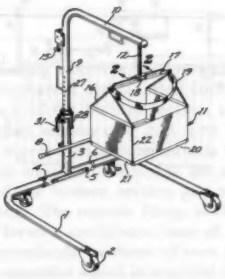
A bed is provided having a movable frame for supporting a mattress and supported above a relatively fixed base by means of first and second link sets which permit the movable frame to be adjusted relative to the base. The link sets are so arranged that when the movable frame is in its uppermost position, a first locking member coupled to the movable frame can be positioned to immobilize the first link set so that when the

bed is lowered the movable frame is tilted into the Trendelenberg position. A second locking member is also coupled to the



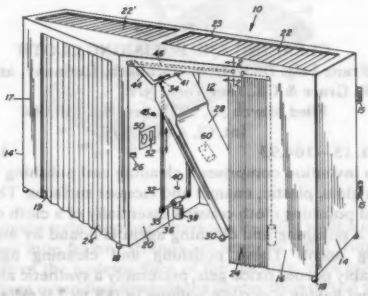
movable frame for engaging the second link set for tilting the movable frame into the reverse Trendelenberg position.

3,711,877
INVALID LIFT AID
Donald H. Averill, 5432 Harco Street, Long Beach, Calif.
Filed March 4, 1971, Ser. No. 120,966
Int. Cl. A61g 7/10, 1/02
U.S. Cl. 5—81 **2 Claims**



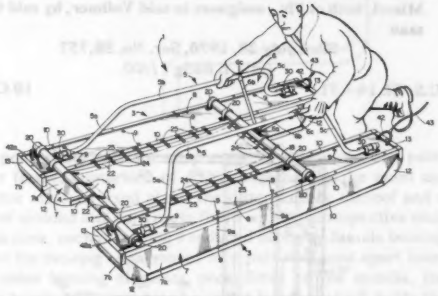
My invalid lift aid is very comfortable for the occupant and can be adjusted both vertically and rotatable about a vertical axis with a minimum of effort. The lift aid may also be folded into a compact unit so that it may be stored in the truck or rear seat of an automobile.

3,711,878
PORTABLE LAYOVER UNITS
Warren T. George, 1611 Clark Avenue, and Donald E. Mason, 2120 Wyoming Avenue, both of Billings, Mont.
Continuation-in-part of Ser. No. 651,160, July 5, 1967. This application Jan. 2, 1970, Ser. No. 4,715
Int. Cl. H47k 1/02; H47c 7/62
U.S. Cl. 5—133 **4 Claims**



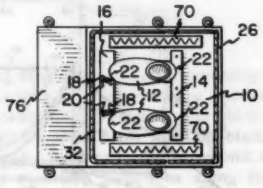
A portable rest facility or unit especially salted for public waiting rooms such as in railroad stations and air terminals, and comprising body-supporting lounge means movable from a tilted, non-usable position to a substantially horizontal usable position by an operating mechanism which is check controlled and which has suitable timing means for regulating the period of time that the body supporting lounge means remains in the usable position.

3,711,879
RESCUE SLED
Norman F. Siefert, 41 Court Road, Winthrop, Mass.
Filed Oct. 26, 1970, Ser. No. 83,890
Int. Cl. B63c 9/04
U.S. Cl. 9—11 R **7 Claims**



A lightweight, portable rescue sled for use on ice and in water for rescuing persons or animals who have fallen through the ice of a body of water such as a pond, river, or lake. The rescue sled includes a pair of lightweight spaced float members having a rescue stretcher supported therebetween for a major portion of the length of the float members, and a pair of hand rails attached to the float members and supported in an essentially upright position by a hand rail support assembly. In operation, the operator of the rescue sled positions himself in an opening defined at the rear of the rescue sled and applies pressure against the hand rails thereby causing the rescue sled to move rapidly across the ice toward a victim in the water. As the rescue sled is caused to move across the ice, the weight of the rescue sled and its operator are spread over a large area of the ice thereby minimizing the danger of breaking through the ice before reaching the victim.

3,711,880
APPARATUS FOR CUSTOM FITTING BOOTS
Melvin W. Dalebout, 3661 Ceres Drive, Salt Lake City, Utah
Filed March 19, 1970, Ser. No. 21,091
Int. Cl. A43d 00/00
U.S. Cl. 12—1 **10 Claims**



A device for custom fitting boots which includes a support platform sized to support a pair of boots for an individual's feet, a reservoir attached to the support platform, conduit means connected to the reservoir and in communication

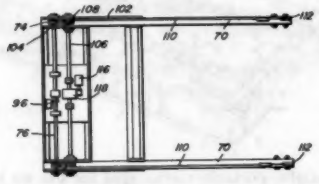
therewith for passing a liquid material in the reservoir to each of the boots supported on the platform, and means connected to the reservoir for urging the liquid material out of the reservoir and into the conduit means. Heating means can be connected to the support platform for heating the environment around the boots and body support members can be secured to the support platforms for supporting an individual's body in an upright position while the boots are being fitted to the individual's feet.

3,711,881

AIRCRAFT LOADING PASSAGEWAY WITH ELEVATABLE CANOPY

Bobby J. Chapman, Coral Gables, and Joseph F. Vollmer, Miami, both of Fla., assignors to said Vollmer, by said Chapman

Filed July 28, 1970, Ser. No. 58,757
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **10 Claims**



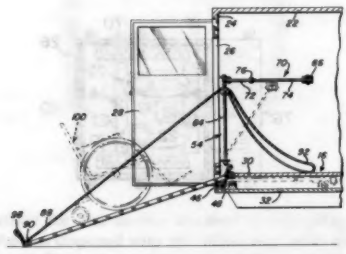
A passageway communicated with the fuselage of an airplane to facilitate enplaning and deplaning of passengers with an elevatable canopy at the outer end thereof mounted on an extendable and retractable carriage to enable a flexible member on the canopy to engage with the fuselage to enable the aircraft to be serviced by the use of a stairway with the passengers staying completely under cover while enplaning or deplaning. The canopy is vertically swingable about a hinge axis in one embodiment and vertically movable in another embodiment with both embodiments of the canopy being supported on a horizontally movable carriage to enable the canopy and passageway to accommodate various airplane fuselage configurations and constructions.

3,711,882

ELEVATED DOORWAY RETRACTABLE RAMP STRUCTURE

John A. Iller, Seattle, Wash., assignor to Adabelle E. Iller, Seattle, Wash., a part interest

Filed Feb. 24, 1971, Ser. No. 118,337
Int. Cl. E01d *15/12*
U.S. Cl. 14—72 **10 Claims**



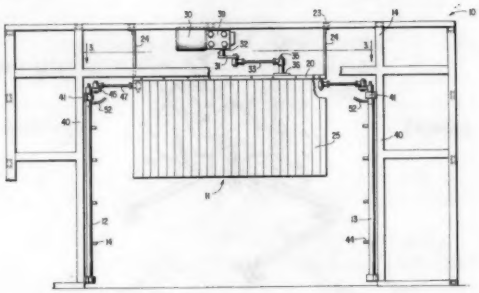
A loading and unloading ramp structure for use in conjunction with an enclosure having one upstanding wall with an elevated entranceway formed therein and an interior floor surface having one exposed edge portion extending across the lower portion of the entranceway. The ramp structure comprises an elongated panel and the enclosure includes a horizontally elongated recess disposed beneath the floor surface thereof and having one end opening outwardly of the lower portion of the entranceway. The elongated panel or panel member is slideably endwise receivable within the recess for endwise extension and retraction relative thereto and retracting, extending and supporting tension member sections are provided and operatively supported from the enclosure structure and connected to the elongated ramp member in a manner such that the ramp structure may be extended or retracted either from within the enclosure structure or from the outside thereof and by a person either standing on his feet or seated in a wheel chair.

3,711,883

VEHICLE SPRAYING AND SCRUBBING DEVICE

George Thomas Ennis, 1354 East State Street, Sharon, Pa.

Filed Sept. 7, 1971, Ser. No. 178,192
Int. Cl. B60s *3/00*
U.S. Cl. 15—97 R **9 Claims**



A vehicle washing apparatus comprising a movable carrier frame with scrubbing means depending therefrom positioned on a supporting framework over the path of a vehicle to be washed. Drive means are adjustably connected to the carrier frame for oscillating the scrubbing means back and forth transversely of the path. A liquid conduit supplied with liquid under pressure for discharge through nozzle means is pivotally mounted for oscillating movement around its vertical axis. Link means adjustably connect the conduit to the carrier frame to oscillate the conduit in conjunction with the oscillating movement of the carrier frame and scrubbing means.

3,711,884

CLEANING AND POLISHING CLOTH

Peter Franz Feig, D638 Ober-Eschbach, Germany, assignor to W. R. Grace & Co., New York, N.Y.

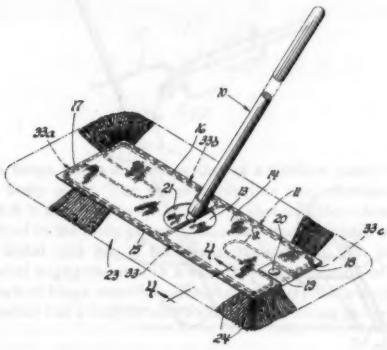
Filed March 31, 1971, Ser. No. 130,004
Int. Cl. A47l *13/17*
U.S. Cl. 15—104.93 **10 Claims**

This invention comprises a cleaning and polishing cloth for use on glass, plastic, enamel and lacquer surfaces. This cleaning and polishing cloth consists essentially of a cloth carrier to which a polishing and cleaning agent is bound by means of a binding agent. These polishing and cleaning agents are preferably porous oxide gels, preferably a synthetic alumina or silica gel having a particle volume of 0.8 to 2.9 m^3/gm, and a particle size spectrum in the range of about 1.5 to 60 microns. This polishing and cleaning cloth does not mar scratch-sensitive surfaces.

3,711,885
DUST MOP

Dana K. Griffin, 24714 Madison Ct. Apt. 296, Farmington, and John R. Wilson, 3203 E. Bradford Dr., Birmingham, both of Mich.

Filed Dec. 24, 1970, Ser. No. 101,305
Int. Cl. A47l 13/20
U.S. Cl. 15—229 AP 1 Claim

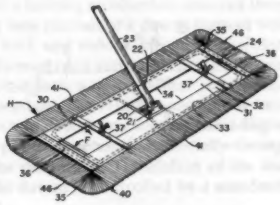


A dust mop having a bottom section which is provided on the lower surface thereof with a tufted cotton yarn extending below the surface of the bottom section, and means for attaching the bottom section of a dust mop handle. The mop bottom section is provided with an outside fringe of continuous loops of yarn which is attached to the outer edges of the lower surface of the bottom section and which is extended outward therefrom. The outside fringe made by a process of weaving which forms a continuous loop of yarn that is interwoven with perpendicular sections of yarn going through the loops to form a shoulder which is attached to the bottom section of the mop.

3,711,886
MOP HEAD FOR A SWEEPING MOP

Don S. Strauss, Denver, Colo., assignor to Majestic Wax Company, Denver, Colo.

Continuation-in-part of Ser. No. 829,029, May 29, 1969. This application March 22, 1971, Ser. No. 126,437
Int. Cl. A47l 13/20
U.S. Cl. 15—229 BP 5 Claims

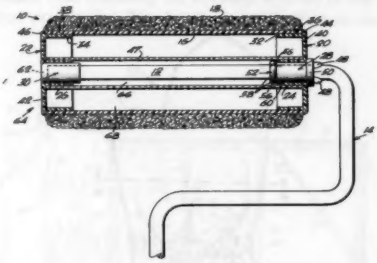


A sweeping style mop head having a backing to fit a conventional dust mop frame. Strands are sewn as a flat fringe near each edge of the undersurface of the backing, with one reach of the fringe extending towards the center thereof and with the other reach of the fringe extending outwardly from the backing, with the fringe lying flatly upon a floor when the mop is in use.

3,711,887
PAINT ROLLER AND BEARING ASSEMBLY

Paul G. Chapman, Hollywood, Fla., assignor to Arsco Paint Rollers, Inc., Hialeah, Fla.

Filed Sept. 30, 1971, Ser. No. 185,168
Int. Cl. A46b 7/10
U.S. Cl. 15—230.11 7 Claims

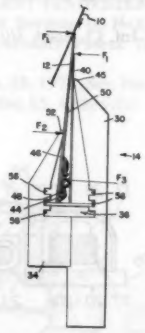


A paint roller unit, for attachment to the spindle of a paint roller frame, comprised of a thin core having the paint applicator material fixed about the outer surface thereof and a pair of molded end caps press-fitted within the respective ends of the core, each providing a reduced diameter female bearing sleeve for bearing engagement on a pair of spaced apart inner and outer bearing elements, press-fitted on the spindle, the inner bearing element being a collet bearing which holds the roller unit in a fixed longitudinal position on the spindle. A thin walled tube, coaxially disposed about the spindle, connects between the female bearing sleeves of the inner and outer end caps.

3,711,888
BLADE HOLDING APPARATUS

Harold E. Dunlap, Auburn, Mass., assignor to Lodding Engineering Corporation, Auburn, Mass.

Filed April 7, 1970, Ser. No. 27,201
Int. Cl. D21g 3/00; B31f 1/14
U.S. Cl. 15—256.51 7 Claims



A doctor for supporting a flexible doctoring or wiping blade is disclosed as including a doctor back and blade holding apparatus comprising first, second, and third force-applying means for applying to the blade when the blade is in operative engagement with a work surface first, second, and third forces in alternately reversing directions along lines which are, respectively, parallel to and spaced increasing distances from the blade leading edge. The force applied by at least the third force-applying means is substantially proportional to the loading force applied by the work surface to the blade. The composite forces applied by the blade holding apparatus to the blade act to minimize the width-wise deflection of the blade and thus to maximize the length-wise flexibility thereof.

3,711,889

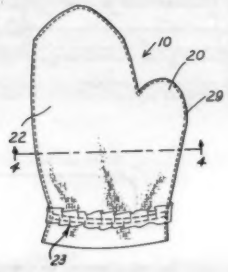
SCRUBBER MITT FOR BATHING

Doris E. Jennings, Route 1, Box 25813, Rogue River, Oreg.

Filed March 26, 1971, Ser. No. 128,244

Int. Cl. A47k 7/02

U.S. Cl. 15—227 3 Claims



A novel scrubber mitt for bathing is provided having a series of pockets for hand and soap, composed essentially of an open-mesh, non-absorbent, non-woven nylon fabric. Because it is made of open-mesh fabric, the mitt provides for free access of water to the soap, promotes lathering, and retains water satisfactorily by capillary attraction when wetted. Because it is non-absorbent it can be dried, at least to a non-dripping condition, by two or three sharp shakes. Because it is non-woven it cannot fray marginally. Because it is of nylon, it is an effective cleanser, is extremely durable, and has a pleasant, stimulating, not too soft and not too rough feeling when applied with moderate pressure to the skin.

3,711,890

WINDSHIELD WIPER

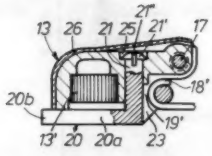
Erich Kolb, Eisental, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 8, 1971, Ser. No. 187,758

Claims priority, application Germany, Oct. 9, 1970, G 70 37 380.7

Int. Cl. B60A 1/04

U.S. Cl. 15—250.34 10 Claims



A windshield wiper has a drive shaft provided with a shoulder and a hub which removably surrounds the drive shaft coaxially therewith. An arm has one end articulated to the hub and an other end to which a wiper blade is connected. A latching element is provided on the hub pivotable about an axis which generally parallels that of the drive shaft and is movable between a first and a second position respectively engaging and withdrawn from the shoulder of the latter. A tension spring has its opposite ends connected to the latching element and to the arm, normally urging the latching element into its first position engaging the shoulder of the drive shaft.

3,711,891

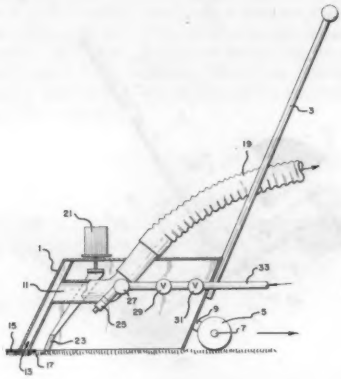
JET-VIBRATOR-VACUUM SYSTEM AND METHOD

Joseph D. Conway, 3311 Warrensville Center Road, Cleveland, Ohio

Filed Aug. 3, 1970, Ser. No. 60,392

Int. Cl. A47l 7/00

U.S. Cl. 15—321 7 Claims



The disclosure relates to a method and apparatus for cleaning rugs, upholstery and the like wherein a high pressure jet of hot liquid or steam cleaning solution, or steam or a combination thereof is discharged into the rug or the like, the cleaning solution then being tamped down into the rug by means of a tamping device such as a vibrator. The rug or the like is then quickly exposed to a vacuum to remove all dirt loosened by jet spray while the dirt is still in suspension.

3,711,892

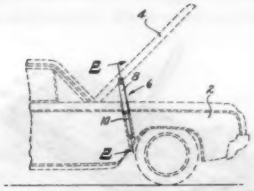
CLOSURE COUNTERBALANCE

Paul C. Tabor, Clawson, Mich., assignor to Meteor Research Limited, Roseville, Mich.

Filed Nov. 7, 1969, Ser. No. 874,798

Int. Cl. E05f 1/08

U.S. Cl. 16—76 9 Claims

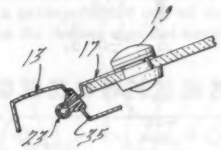


Two telescopically related tubes to be secured at their outer ends to a closure and closure support, respectively. A compression spring within the tubes urges them apart and stop means limit the extension of the device. In one form, a helical torsion spring between the tubes is fixed at one end to the outer tube and normally contracts to frictionally grip the inner tube. A rotatable sleeve is connected to the other end of the spring so it can be manually expanded to release its grip on the inner tube.

3,711,893
VENT WINDOW HINGE

Ralph J. King, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed March 26, 1971, Ser. No. 128,431
Int. Cl. E05d *9/00*
U.S. Cl. 16—128 **2 Claims**

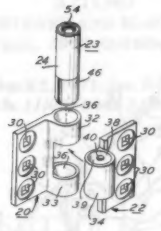


A hinge for swingably mounting a window panel on a vehicle body pillar. The hinge comprises two members, one of which is attached to the window panel and the other of which is fixed to the body pillar. The panel attached hinge member at its distal end has a tubular portion which has interfitting pivotal engagement with a tubular socket portion of the pillar attached hinge member. The body of the pillar attached hinge member has a snap-in retention in an aperture in the body pillar.

3,711,894
LOCKING BAR ASSEMBLY

Russell W. Walters, Whitehall, Pa., assignor to BMR Security Products Corporation, Reading, Pa.

Filed Oct. 19, 1970, Ser. No. 81,764
Int. Cl. E05d *11/10;* **E05b** *65/44, 65/02*
U.S. Cl. 16—144 **19 Claims**



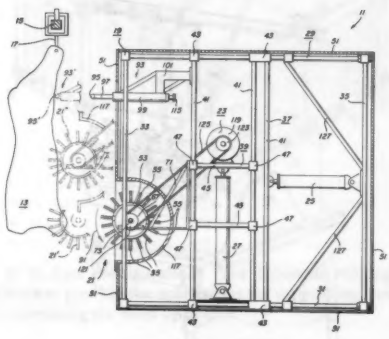
A locking bar assembly to restrain displacement between relatively moveable elements. The assembly comprises a pair of moveable members rigidly attached to the elements being restained and a locking mechanism inserted therein to actuate a locking pin into and out of a detent formed within one of the members to lock and unlock the moveable elements. An extension pin formed on a surface of one of the moveable members is inserted into a longitudinal slot machined into the locking mechanism. The relative positioning between the slot, extension pin and detent provides for axial alignment between the locking pin and detent substantially facing the element surfaces to be restrained. Translation of the locking pin into and out of the detent is controlled by a standard key actuated cylinder lock.

3,711,895
AUTOMATIC CARCASS PROCESSING DEVICE

Donald L. Arendale, 722 Parkdale, Memphis, Tenn.

Filed Aug. 10, 1971, Ser. No. 170,467
Int. Cl. A22b
U.S. Cl. 17—1 R **8 Claims**

Apparatus for removing blood clots from the jowl area and bone dust from the loin and rib area of the carcass of an animal intended for human consumption, e.g., a hog or the like. The apparatus comprises an overhead conveyor system having a plurality of roller hook assemblies runningly riding thereon with the respective carcasses depending therefrom. A rotatably driven drumlike brush assembly having a plurality of nozzles with water emanating therefrom is caused to travel horizontally until the peculiar resilient fingers thereof engage the carcass, thus initiating the accomplishment of the above-described processing. The brush assembly then is caused to

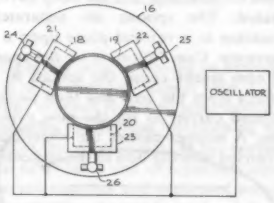


travel vertically at a predetermined rate which is compatible with the rate of travel for the conveyor assembly so that as the brush assembly travels upwardly, one-half of the carcass is processed and downward travel thereof processes the opposite half. The apparatus automatically accomplishes the processing, i.e., completely without the assistance of manual labor. Accordingly, the apparatus includes various operable structure and other components constituting a control system for sequentially actuating the operable structure.

3,711,896
ULTRA-SONIC MEAT TENDERIZING APPARATUS

Jerald Guberman, and Herman D. Holt, both of Las Vegas, Nev., assignors to Advance Patent Technology, Inc., Las Vegas, Nev.

Filed Feb. 25, 1970, Ser. No. 13,901
Int. Cl. A22c *9/00*
U.S. Cl. 17—25 **1 Claim**

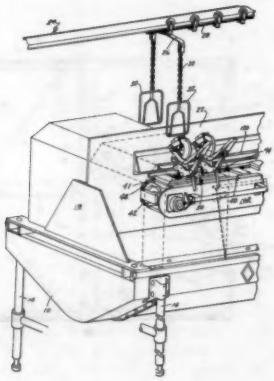


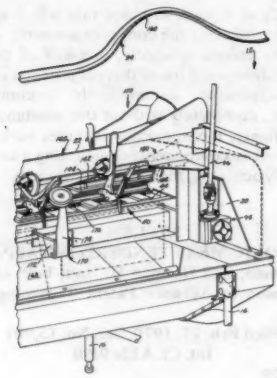
The present invention is one in which ultra-sonic energy is used to break down the muscle fibers in meat, thereby tenderizing the meat. The device is basically simple. The meat is placed between metal plates to which ultra-sonic transducers have been bonded. Electrical energy is transformed by the transducers into sonic waves, and the meat need only be subjected to this form of energy for a period of time.

3,711,897
METHOD AND APPARATUS FOR EVISCERATING POULTRY

Louis A. Viscolosi, Providence, R.I., assignor to International Agri-Systems, Inc., Ottumwa, Iowa

Filed Feb. 8, 1971, Ser. No. 113,277
Int. Cl. A22c *21/06*
U.S. Cl. 17—45 10 Claims





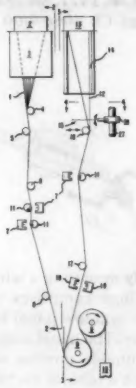
An eviscerating apparatus utilizing two opposed spoon members adapted for insertion into the body cavity of the bird to be eviscerated. The spoons are separately pivotally mounted for rotation in a vertical plane upon a carriage attached to a conveyor. Cam followers on the spoon members and associated cam tracks cause the spoons to separate, to remove the viscera from the bird and then partially close to permit an overhead carrier to lift the now eviscerated fowl from the spoons. A scraper pushes the viscera off the lower spoon and it is carried with the bird to the inspection station.

3,711,898
PROCESS FOR FORMING NONWOVEN WEBS FROM COMBINED FILAMENTS

Samir Costandi Debbas, Hendersonville, Tenn., assignor to E. I. du Pont de Nemours and Co., Wilmington, Del.

Filed April 13, 1971, Ser. No. 133,487
Int. Cl. D04h *3/14*
U.S. Cl. 19—155 5 Claims

In a process for forming nonwoven webs from combined binder and matrix filaments, both types of filaments are separately charged to obtain uniform filament separation and the binder filaments are neutralized prior to combining with the matrix filaments. The combined filaments are forwarded

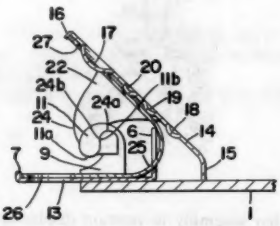


by means of a jet for collection as nonwoven web. Neutralizing the charge on the binder filaments allows a higher charge level to be used on the matrix filaments to improve product uniformity.

3,711,899
CLIPBOARD AND CLIP THEREFOR

Warren E. Shelton, Strongsville, Ohio, and Samuel M. Harris, 260 West Streetsboro Road, Hudson, Ohio, assignors to said Harris, by said Shelton

Filed May 21, 1971, Ser. No. 145,708
Int. Cl. B42f *1/00*; A44b *21/00*
U.S. Cl. 24—67.7 6 Claims



A clipboard is provided in which pivotal movement of the clamping member in relation to the supporting member is effected by the provision of interlocked hook-like portions on the members, which hook-like portions act as fulcrum points for each other, and the provision of an extraneous pivot pin is not required. The members cannot be disengaged from each other, without first removing the spring which biases the clamping member to clamping position.

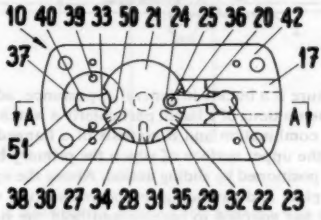
3,711,900
SHOE CLOSURE DEVICE ESPECIALLY FOR SKI SHOES

Robert Schoch, Singen/Hohentwiel, Germany, assignor to Weinmann Aktiengesellschaft, Schaffhausen, Switzerland

Filed Sept. 27, 1971, Ser. No. 183,991
Int. Cl. A43c *11/00*
U.S. Cl. 24—68 SK 4 Claims

In a shoe having a pair of closure flaps, a closure device comprising a pull member coupled to one of the shoe flaps at one end thereof, a coupling device mounted on another one of the shoe flaps and comprising a rotatably mounted disc, a

member coupling the pull member to the disc in a manner that rotation of the disc causes a longitudinal displacement of the pull member, the disc being at least partially formed as a maltese cross having leg portions with recesses formed between adjacent leg portions and groove means formed in the leg portions, the coupling member comprising a connecting strap jointed with the disc, a driving member disposed adjacent the disc and having a pair of pins formed thereon, the driving member being mounted for rotation and the pins during rotation engaging a predetermined one of the groove means, a cam member on the driving member having convexly shaped



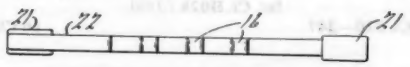
end portions for engagement with a predetermined one of the recesses formed on the maltese cross shaped disc and forming a latch therewith in a rest position, the cam member having concavely shaped side surfaces connecting the end surfaces for allowing unimpeded passage of the end portions of the legs of the disc during rotation of the disc by the pins, whereby a rotation of the driving member causes one of the pins entering the groove means and thereby rotating the disc, and as a result, the coupling strap fixedly coupled to the pull member becomes displaced along a straight line and causes the pull member to move therewith.

3,711,901

ROPE TIGHTENER AND SLACK REMOVER

Robert Howard Close, 3900 Oakhills Drive, Birmingham, Mich.

Filed April 5, 1971, Ser. No. 130,978
Int. Cl. A43c *11/00*; **A44b** *21/00*; **D06f** *53/00*
U.S. Cl. 24—71.3 **4 Claims**



The rope tightener is supported by or is engageable with a rope, line, cord or the like before or after it is manually tensioned and thereafter manipulated to draw the rope taut. The rope is stressed by having it located at a fulcrum point about which the device is turned in the plane of the device or in a plane normal thereto to stretch the rope. The device is secured against reverse rotation by placing a reach of the rope under a spaced reverse lock at the end thereof. The device is a compact, rigid element and the one herein illustrated is capable of applying a tension of approximately 175 pounds to the stretched rope.

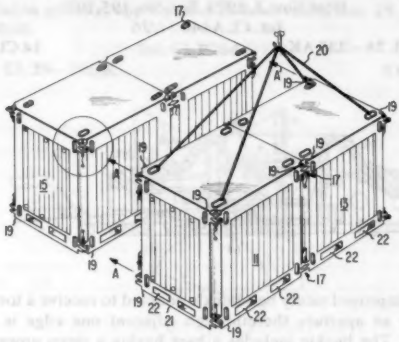
3,711,902

COUPLING STRUCTURE FOR JOINING CONTAINERS

Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to The Budd Company, Philadelphia, Pa.

Filed Dec. 22, 1971, Ser. No. 210,701
Int. Cl. A44b *21/00*; **B65j** *1/04*
U.S. Cl. 24—81 E **3 Claims**

Coupling mechanism for supporting and positioning a plurality of containers into an array. The mechanisms are captive to corner fittings of the containers and enable individual container to be joined together to form arrays which can be lifta-



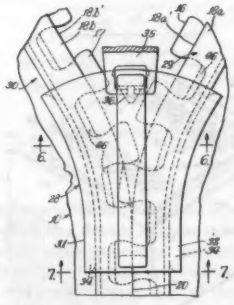
ble in various configurations. The elements making up the mechanism provide the sole means for supporting, positioning and restraining the built-up arrays.

3,711,903

SLIDE FASTENER

Alexander M. Brown, 715 S. Beach St., 309-D, Daytona Beach, Fla.

Filed Dec. 11, 1968, Ser. No. 782,973
Int. Cl. A44b *19/32*, *19/10*
U.S. Cl. 24—205.1 **22 Claims**

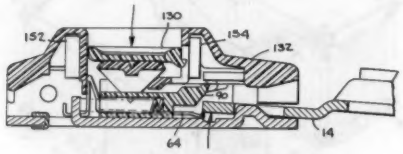


An interdigitating fastener having an extruded slit core strip embedded in an extruded slit carrier strip. The core strip is slit in a serpentine manner to define interdigitating exposed portions and includes mechanical interlocking means for retaining each half of the slit core strip in the corresponding carrier strip portion to define a pair of separable assemblies adapted to be connected together and separated selectively by means of an associated slider. In one form the slider is provided with a wedging diamond which extends sufficiently to engage the carrier above and below the core strip and in a second form the slider includes a diamond which engages only the carrier strip outwardly of one face of the core strip. The fastener is economically manufactured by extruding the core strip, slitting the extruded core strip to define the serpentine interdigitating portions, extruding a carrier strip about the slit core strip and slitting the carrier strip to define a pair of core and carrier strip assemblies.

3,711,904
SAFETY BELT BUCKLE

James A. Gavagan, Center Line, and Louis Romanzi, Jr., Milford, both of Mich., assignors to Irvin Industries, Inc., Greenwich, Conn.

Filed Nov. 3, 1971, Ser. No. 195,107
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 AK 14 Claims

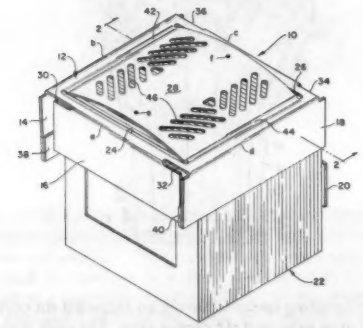


An improved safety belt buckle adapted to receive a tongue having an aperture therethrough adjacent one edge is disclosed. The buckle includes a base having a steep upwardly extending projection adjacent the buckle's front edge, a tongue dislodging member on the base adjacent to the projection, and a tongue control member which normally overlies and locks the tongue in position and which is moved rearwardly to free the tongue. During rearward movement of the control member, it contacts the dislodging member effecting upward movement of the dislodging member and tongue to forceably free the tongue.

3,711,905
SLIDE HOLDER

George H. Eckerdt, and William P. Ewald, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 7, 1971, Ser. No. 205,678
Int. Cl. A44b *21/00*; B65d *85/46*; B66c *1/10*
U.S. Cl. 24—263 PC 12 Claims

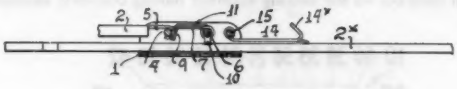


A slide holder for storing and/or transporting a stack of slides is generally box shaped with one open side. Two opposed sides have resilient pads mounted thereon to form spaced slide gripping members positionable on opposite sides of an assembled group of slides. The gripping members are movable toward and away from each other for selectively gripping and releasing the slides. The top wall connecting the gripping members forms snap action, overcenter spring means having a first stable condition for simultaneously urging the members toward each other to the slides and a second stable condition for simultaneously urging the members away from each other to release the slides. The slide holder may be used to transport a stack of slides from a storage container to the magazine of a slide projector.

3,711,906
BAND SAFETY LOCK FOR WATCH BANDS AND THE LIKE

Henry Leon, 83-40 Edgerton Blvd., Jamaica, N.Y.

Filed Jan. 31, 1972, Ser. No. 221,987
Int. Cl. A44c *5/18*; A44b *11/25*
U.S. Cl. 24—265 WS 5 Claims

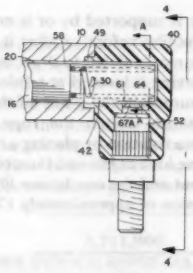


The structure is a buckle in general appearance, adapted to hold opposite sections of a band, particularly a watch band, in safety-lock, combination and it consists of a flanged holding plate along the upper surface of which the primary band section may be positioned by sliding action. Above the upper surface of the plate and extending to end connection with said flanges, is a bar adapted to receive and hold the hook of a plate-end of the normally free end of the band. Spaced from the first bar is a second bar holding two spring-engaged locking members, a first locking member having mutually spaced downwardly extended fingers adapted to abut the first bar and carrying grip means to engage the primary band area resting on the plate and to firmly hold said band section at the point to which it is adjusted. Between the fingers of the said first locking member a recess is provided and the second of said spring-engaged locking members is formed with downwardly-extending fingers at its free end, to enter said recess and extert, by the fingers, holding action on the hook resting on the aforesaid bar. Finally, a hinged cover plate, on a third bar held by the flanges of the first named plate, is adapted to be moved over the stated assembly and to engage by latching fingers the first named bar.

3,711,907
ELECTRIC PUMP COMMUTATOR BRUSH HOLDER CONSTRUCTION

Russell Parrent, Fairfield, Ill., assignor to Airtex Product Div., United Industrial Syndicate, New York, N.Y.

Filed March 30, 1972, Ser. No. 239,673
Int. Cl. H02k *13/00*
U.S. Cl. 310—247 10 Claims

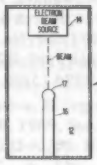


For a submersible electric fuel pump a commutator brush holder construction is provided of molded body construction comprising a motor end casing and spring holders attached to it. The holders have coil springs which bias respective brushes into commutator engagement and also have contact springs of flat spring leaf material, U-shaped to bracket the coil springs, to provide electrical conduction to connection terminals secured to the spring holders.

3,711,908
METHOD FOR FORMING SMALL DIAMETER TIPS ON SINTERED MATERIAL CATHODES

Alec N. Broers, Purdys Station, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 27, 1970, Ser. No. 67,464
Int. Cl. H01j 9/16, 9/44
U.S. Cl. 29—25.18 4 Claims

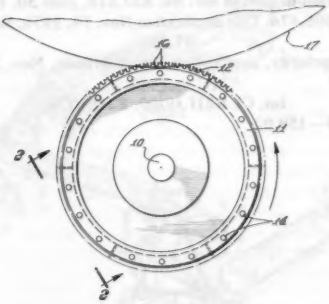


There is disclosed a method for forming tips on normally sintered material electron-emitting cathodes. The method comprises melting the electron-emitting end of the cathode with an electron beam or other suitable narrow beam heating means, such as a laser, for example. This melting produces a dense fused mass at the end of the cathode. This fused mass can then be polished to a tip having a very small diameter such as substantially less than 5 microns.

3,711,909
TIRE RASP

Maurice R. Commanday, Palos Verdes Estates; Eugene V. Clark, Northridge, and Gregor Baladjanian, Woodland Hills, all of Calif., assignors to Chromalloy American Corporation, New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,612
Int. Cl. B26d 1/00
U.S. Cl. 29—79 R 6 Claims

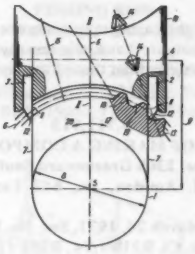


The wear life of a tire rasp of the type comprising a rotor carrying steel teeth segments operable to abrade and reduce a tire tread applied thereto, is multiplied by the diffusion of boron within surface depths of the segments imparting to their teeth surprising wear and abrasion resistance.

3,711,910
MILLING HEAD CUTTERS

Bohuslav Strejc, Plzen, Czechoslovakia, assignor to Skoda, narodni podnik, Plzen, Czechoslovakia

Continuation of Ser. No. 888,645, Dec. 29, 1969, Pat. No. 3,621,755. This application Nov. 18, 1971, Ser. No. 200,096
Claims priority, application Czechoslovakia, Dec. 29, 1968, 8880/68
Int. Cl. B26d 1/12
U.S. Cl. 29—105 R 5 Claims

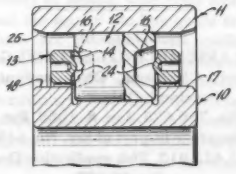


A milling head for forming globoid worms, having two sets of cutting instruments. One set of cutters is fixed. The other set is removable. The cutting edges are arranged along specific axes and directions to effect cutting.

3,711,911
METHOD OF ROLLER BEARING RETENTION AND ASSEMBLY

Michael Schweitzer, Southington, Conn., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 821,569, May 5, 1969, Pat. No. 3,586,407. This application Nov. 25, 1970, Ser. No. 92,705
Int. Cl. B21d 53/12; B23p 11/00
U.S. Cl. 29—148.4 C 3 Claims



The invention contemplates a method of retaining recessed-end bearing rollers in a ductile annular retainer having plural angularly spaced roller-receiving pockets, wherein each pocket extends radially through the retainer and is confined at axial ends by end walls forming part of the annular retainer, there being a local axially outwardly open central recess in the end walls at each roller-pocket location whereby the region of remaining wall material at each central recess is locally relatively weak. The rollers are retained by essentially limiting retainer end-wall indentations to the relatively weak regions.

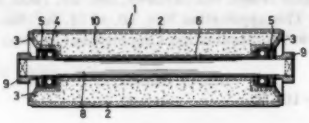
3,711,912
SUPPORT ROLLER FOR CONVEYOR BELTS AND THE LIKE

Fritz Teske, Industriestr. 28, and Lothar Teske, Industriestr. 30, both of Porz-Westhoven, Germany

Filed Feb. 5, 1971, Ser. No. 112,875
Claims priority, application Germany, Feb. 5, 1970, P 20 05 211.3
Int. Cl. B21b 13/02
U.S. Cl. 29—116 R 8 Claims

A cylindrical supporting roller comprises a central core of a light-weight material having a low density and a casing extend-

ing over the surface of the core which comprises a material having a substantially greater density to reinforce the core.



Both the core and the casing may comprise a closed pore foam material such as polyurethane, the density of polyurethane in the casing being greater than that of the core.

3,711,913

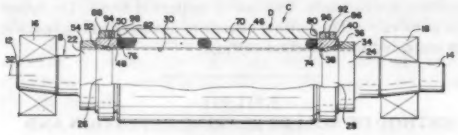
METHOD OF MAKING A COMPOSITE ROLL

Vincent A. Galeone, 2368 Greensward South, Warrington, Pa., and Charles H. Amidon, Jr., 645 Lexington Rd., Warminster, Pa.

Filed March 24, 1971, Ser. No. 127,473

Int. Cl. B21h *1/14*; B23p *11/00*

U.S. Cl. 29—148.4 D **2 Claims**



Method of making a composite roll including a central metal shaft having a plurality of porous discs assembled thereon and held in compression. A sleeve member of synthetic plastic material is received over the porous discs. The porous discs are machined to form a substantially smooth and undamaged cylindrical surface prior to application of the plastic sleeve thereover.

3,711,914

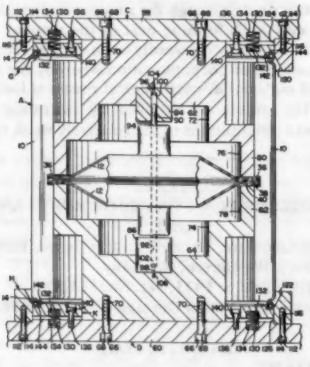
METHOD FOR ASSEMBLING CENTRIFUGAL BLOWERS

Harold L. Baker, Cleveland, Ohio, assignor to Morrison Products, Inc., Cleveland, Ohio

Division of Ser. No. 789,675, Jan. 8, 1069, Pat. No. 3,608,174, which is a continuation-in-part of Ser. No. 649,616, June 28, 1967, Pat. No. 3,423,012. This application Dec. 7, 1970, Ser. No. 95,987

Int. Cl. B23p *15/02*

U.S. Cl. 29—156.8 CF **3 Claims**



A centrifugal blower wheel is assembled by forming a blade strip into a cylinder around a central hub disc. The circular axial ends of the cylinder are positioned in channel-shaped circular end rings. An axial force is applied to the assembly and the end rings are simultaneously deformed into gripping engagement with the cylinder ends. The central hub disc has a bifurcated outer periphery which is deformed outwardly into engagement with notches in the blades subsequent to deformation of the end rings.

3,711,915

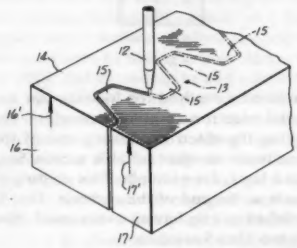
METHOD OF MAKING TOOTHED RACKS

Glenway Maxon, Jr., and William H. B. Wright, III, both of 3129 West Mill Road, Milwaukee, Wis.

Division of Ser. No. 17,126, March 6, 1970. This application Aug. 5, 1971, Ser. No. 169,221

Int. Cl. B21d *53/28*; B21h *5/00*; B21k *1/30*; B23p *15/14*; B29d *15/00*

U.S. Cl. 29—159.2 **9 Claims**



The flame of a cutting torch is passed through a central longitudinal zone of an elongated blank so that the kerf forms two rack sections with substantially identical teeth thereon. Rack sections with such flame cut teeth are secured together in side-by-side relationship, with their teeth in endwise register, to form a rack exceeding the thickness of the blanks from which the rack sections are cut. Before flame cutting of the teeth is commenced, thin slices are flame cut from opposite faces of the blank which are to become the backs of the rack sections, to prevent warping of the flame cut rack sections along their lengths.

3,711,916

METHOD OF MAKING WIRE-SPOKED WHEELS

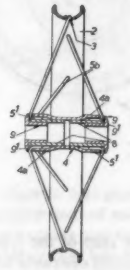
Ian Goodhall Meiklejohn, Fife, Scotland, assignor to I. G. Meiklejohn & Company Limited, Kingslaw, Fife, Scotland

Continuation-in-part of Ser. No. 837,515, June 30, 1969, Pat. No. 3,606,474. This application Nov. 19, 1970, Ser. No. 91,100

Claims priority, application Great Britain, Nov. 20, 1969, 56,759/69

Int. Cl. B21f *39/00*; B21k *1/34*

U.S. Cl. 29—159.02 **1 Claim**



A wire-spoked wheel construction is disclosed in which wire spokes extend from a wheel rim to a centrally positioned hol-

low hub member open on each end with radial apertures on each end of the hub member permitting insertion of the ends of the spokes which are bent axially with respect to the hub with retaining inserts being positioned in the hub for maintaining the spokes in position ; a method of fabricating the wire-spoked wheel construction is disclosed in which a plurality of wire spokes each having two limbs are positioned with the innermost ends of the limbs extending through holes in the hub member followed by bending the inner end portions of the limbs inwardly by forcing a pair of snug fitting inserts into the hub ends to consequently tension the spokes and anchor the spokes in the hub member.

3,711,917

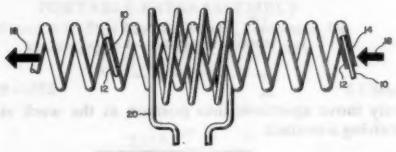
COATED SPRING

George R. Baumgras, Downey, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Aug. 18, 1969, Ser. No. 850,827

Int. Cl. B21f *35/00*; B23p *13/00*

U.S. Cl. 29—173 **4 Claims**



This disclosure relates to springs that are encased in a coating of protective-material, this protective-material being of the heat-shrinkable type; so that the disclosed arrangement permit simultaneous heat-treating of the spring-material and heat-shrinking of the protective material.

3,711,918

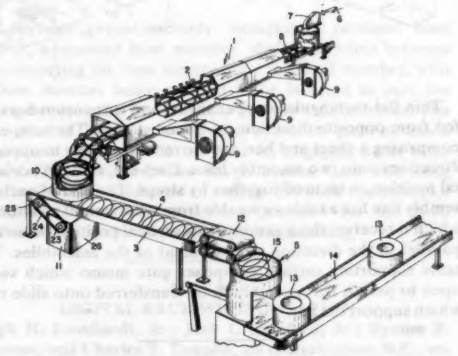
SPLIT LEVEL CONVEYOR AND COLLECTING MEANS FOR CONTROLLED COOLED STEEL ROD

Terence Michael Shore, Poynton, England, assignor to Morgan Construction Company, Worcester, Mass.

Filed Aug. 3, 1970, Ser. No. 60,319

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 B **5 Claims**



The conveyor and collecting apparatus described obtains several advantages in conjunction with the controlled cooling of steel rod through transformation and the ultimate collection of the rod. The apparatus includes a first-level conveyor for passing steel rod immediately after rolling through a controlled cooling zone, where transformation occurs, and a second-level conveyor for receiving the transformed rod at the end of the first conveyor and for transporting the rod to a collecting apparatus. On both conveyors the rod is transported in the form of overlapping, non-concentric rings, although the rate of progression of both conveyors is not necessarily equal, and hence the degree of overlap of the rings may be different for each conveyor. The second conveyor includes means to vary the rate of transport of the rod rings, and also means to stop the conveyor operatively in conjunction with means to cut the rod.

3,711,919

APPARATUS FOR ASSEMBLING A LINE GUIDE TO A FISHING ROD

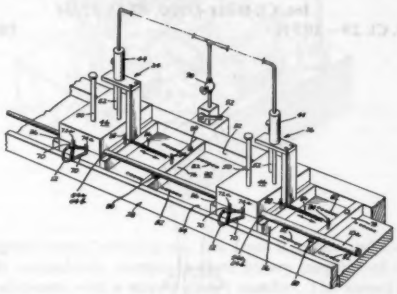
Barry D. Cousin, Walkerton, Ind., assignor to Plas/Steel Products, Inc., Walkerton, Ind.

Division of Ser. No. 30,133, Nov. 20, 1970, Pat. No. 3,651,561.

This application Aug. 2, 1971, Ser. No. 168,333

Int. Cl. B23p *19/00, 19/04*; B29p *19/02*

U.S. Cl. 29—200 P **7 Claims**



This invention relates to an apparatus for attaching a line guide to a fishing rod by means of preformed helical wire coils surrounding both the legs and the rod. The method and apparatus for attaching the line guide to the rod includes a pair of relatively movable fixtures having die cavities adapted to receive an assembly of helical wire coils and a line guide in such position that the legs of the line guide are fitted into the coils. The fixtures are provided with collinear die bores through which may be inserted in succession a tapered rod, the die bores being in registry with the wire coils such that the rod can pass therethrough. The rod is forced into tight engagement with the coils relative movement between the fixtures facilitating engagement first with the foils in the recess of one fixture and secondly with the coils in the recess of the other fixture.

3,711,920

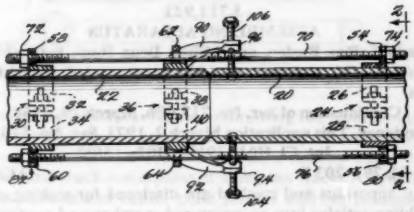
PIPE PULLER AND ALIGNMENT CLAMP

Richard L. Simmons, Jr., P. O. Box 740, Wilmington, N.C.

Filed March 2, 1972, Ser. No. 231,111

Int. Cl. B23p *19/00, 19/04*

U.S. Cl. 29—200 P **4 Claims**



An apparatus for aligning two pipe sections, for example for welding, having at least two clamp members each attachable to one of the two sections. One of the clamp members is pro-

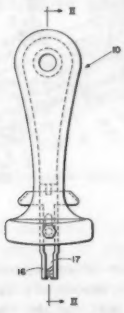
vided with manually adjustable threaded members which contact the section to which it is not attached for axially aligning the two pipe sections. The two clamp members are connected together by a plurality of threaded rods which extend parallel to the axes of the aligned pipe sections and on which nuts can be manually screwed to urge the two pipe sections together. The apparatus can be used on straight, T, and Elbow sections.

3,711,921

TERMINATING TOOL FOR WIRES

George Debortoli, Ottawa, Ontario, and Helmut Hans Lukas, Carleton Place, Ontario, both of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Sept. 13, 1971, Ser. No. 179,723
Int. Cl. H01r *43/00;* H05k *13/04*
U.S. Cl. 29—203 H 10 Claims



Terminating tool for thin wires, for example as used in wiring terminal blocks in telephone systems, in which the wire is sheared by the cooperative relative sliding movement of two members. A first member is attached to a handle and the second member projects slightly from the bottom of the first member. A wire is positioned in a slot in the lower end of the second member and the wire is then pushed down between terminal clips. On meeting the surface of the terminal block the second member slides relative to the first member and shears the wire. Damage to the terminal block is avoided and the cut wire does not become imbedded in the terminal block - common occurrences with conventional tools which use the terminal block as an anvil to cut the wire.

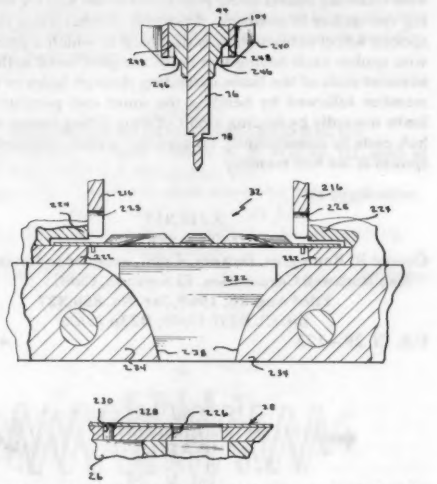
3,711,922

ASSEMBLING APPARATUS

Willard LeRoy Busler, and Milton Dean Ross, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 717,086, March 29, 1968, abandoned. This application March 2, 1971, Ser. No. 120,355
Int. Cl. H01r *19/04;* H02g *15/00*
U.S. Cl. 29—203 B 3 Claims

An apparatus and method are disclosed for staking or assembling articles into an apertured member and particularly for assembling electrical contacts into a printed circuit board. The contacts are intermittently fed in strip form to a work station whereat they are severed from the strip for individual assembling into the board. The printed circuit board is provided with rows of apertures for receiving the contacts and the board is indexed either manually or automatically to succes-



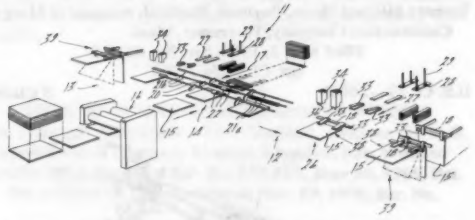
sively move apertures into position at the work station for receiving a contact.

3,711,923

MACHINE AND PROCESS FOR ASSEMBLING CATHODES

Cass S. Kasper, Grosse Pointe, and Vernon Rott, Mount Clemens, both of Mich., assignors to Inter-Lakes Engineering Co., Mount Clemens, Mich.

Filed Jan. 14, 1972, Ser. No. 217,782
Int. Cl. H01g *13/00*
U.S. Cl. 29—203 L 19 Claims



Thin flat rectangular copper sheets and suspension bars are fed from opposite directions to a feed station. The sets, each comprising a sheet and bar, are moved alternately in opposite directions onto two assembly lines. Each set, while in horizontal position, is secured together by straps. The end of each assembly line has a table swingable from a horizontal position, in which it receives the assembly, to a vertical position on an axis parallel to the direction of movement of the assemblies. The table supporting surface comprises gate means which swing open to permit the assembly to be transferred onto slide rails which support the bar.

3,711,924

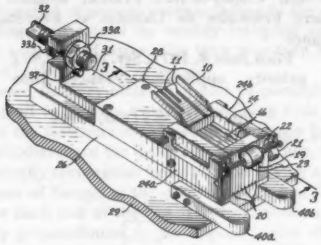
GRAVITY-FED PIN INSERTION DEVICE

Frederick D. Olney, Jr., Phoenix, and Robert O. Crump, Scottsdale, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed March 11, 1971, Ser. No. 123,361
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B 9 Claims

A pin insertion device which uses gravity to feed straight pins into a hopper employs a plurality of partitions to align the

pins with a plurality of ports in one wall of the hopper. The pins are held in alignment by the ports and by a groove in a



pusher while the pusher moves the pins through the ports for insertion into holes in a circuit board which is positioned near the ports.

3,711,925

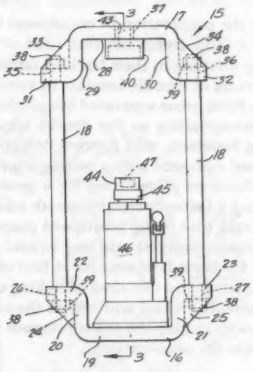
PORTABLE PRESS ASSEMBLY

Edward Mazer, 620 East Mufflin Street, Lancaster, Pa.

Filed Sept. 25, 1970, Ser. No. 75,321

Int. Cl. B23p 19/04

U.S. Cl. 29—252 **4 Claims**



A portable press assembly including a recessed base member, a recessed head member, shafts extending between and connecting the base member and the head member, with the base member being adapted to be inverted to vary the spacing between the base member and the head member. The base member has a conventional hydraulic jack mounted thereon and provided with adapters for engaging items to be pressed. The head member has a central bore extending therethrough and is adapted to engage the work oppositely of the hydraulic jack. Adapters are provided for the head member to engage various objects during pressing.

3,711,926

DIGITAL RACK WIRING STATION

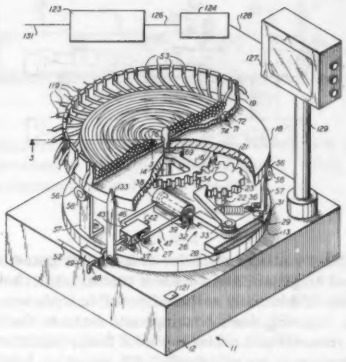
Joseph H. Leonhardt, Jr.; Jack I. Lunsford, Jr.; Bynum B. Sharpe, and Charles T. Templin, all of Burlington, N.C., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 1, 1971, Ser. No. 185,579

Int. Cl. H01r 43/00

U.S. Cl. 29—203 B **10 Claims**

A digital rack wiring station has facilities for visually displaying individual wiring steps of a series of wiring steps in a predetermined sequence and facilities for moving individual wires of a group of wires into a preselected position in accordance with the particular wiring step displayed. A rotatably mounted receptacle having a plurality of slots formed in the wall supports the plurality of wires therein and an end of each wire in one of the slots. A plate having a series of coded references in the form of binary numbers supports the receptacle and is aligned therewith such that each of the binary numbers corresponds to one of the slots. As the plate is incrementally rotated through a gear arrangement, the coded references are moved over a number of sensing elements which sequentially reads and forwards the binary number to a



Data Register and Control Unit. The Data Register and Control Unit individually compares each binary number of the sensing elements with a stored binary number. The stored binary number corresponds to a particular slot holding the wire called for in the displayed wiring step. If a difference is found to exist between the binary number read by the sensing elements and the stored binary number, the Data Register and Control Unit continues to energize facilities to incrementally rotate the plate and the receptacle until there is no difference between the binary numbers. At this time, the particular wire called for in the wiring step is in the preselected position.

3,711,927

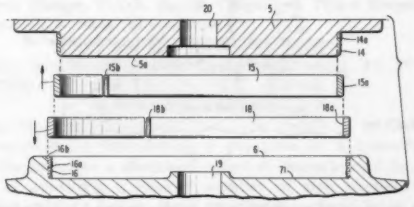
METHOD AND APPARATUS FOR RECONDITIONING THE CONNECTION BETWEEN A RAILWAY CAR BODY AND A RAILWAY CAR TRUCK

John P. Davidson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sept. 2, 1970, Ser. No. 69,323

Int. Cl. B23p 7/00

U.S. Cl. 29—401 **4 Claims**

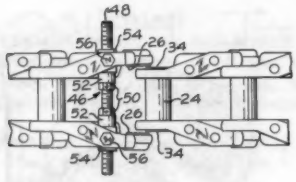


Method and apparatus for reconditioning the pivot connection between a railway car body and a railway car truck where the reconditioning is effected in situ on a railway track. The car body and truck are separated along the track. A cylindrical boss surface and center plate pocket wall are machined, respectively, on a center plate carried by the car body and a bolster carried by the truck. Wear rings are installed on the machined boss surface and truck bolster carried, center plate pocket wall prior to the assembly of the truck and car body.

3,711,928
METHOD OF REPAIRING AND SERVICING LUBRICATED TRACK CHAINS

Roger L. Boggs, E. Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed April 2, 1971, Ser. No. 130,650
Int. Cl. B23p 7/00
U.S. Cl. 29—401 11 Claims

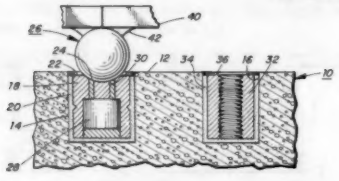


A method and apparatus for disassembling and assembling individual hinge joints of a crawler tractor track chain wherein a plurality of manually actuated portable tools are utilized to separate coacting pins, bushings and links to facilitate convenient removal and replacement of faulty joint components. The components are principally vital, sensitive, lubricant-containing seals. The invention enables reassembly of associated members without tediously disassembling all of the track sections intermediate a leaking joint and a track master joint.

3,711,929
METHOD OF ASSEMBLING A MEASURING AND LOCATING SYSTEM

Alexander G. Blakey; Jack S. Adams, and James J. Swarts, all of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 821,587, May 5, 1969, abandoned. This application March 19, 1971, Ser. No. 126,022
Int. Cl. B23q 17/00
U.S. Cl. 29—407 21 Claims



A method of assemblying a measuring and locating system utilizing a novel surface plate and fixtures associated therewith is disclosed. Basically, a plurality of recesses of uniform shape are formed in a surface and magnetic attraction means are positioned adjacent to the recesses. Ferromagnetic members having shapes and spacing corresponding to the shapes and spacing of the recesses are fastened to measuring and locating fixture bodies. Gages or positioning means on the fixtures are then adjusted as desired. The system is then ready for use in the dimensional measurement of workpieces, locating workpieces for automatic machining, etc.

3,711,930
PROCESS AND DEVICE FOR MAKING SLIDE FASTENERS

Marcel Potin, Choisy-le-Roi, France, assignor to Societe Financiere Francaise de Licences et Brevets, Choisy-le-Roi, France

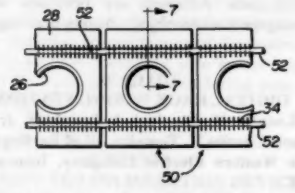
Filed June 8, 1971, Ser. No. 150,992
Claims priority, application France, June 12, 1970, 7021637
Int. Cl. B23p 11/00, 19/04
U.S. Cl. 29—408 7 Claims

A process for the preparation of continuous fastener chain in the form of a strip comprises two rows of linking components fixed by stitching to their backing tapes, for the making of slide fasteners of specific lengths, by removing the linking components from areas separated longitudinally from one another and corresponding to the spaces required between two neighboring fasteners, said process comprising the steps of providing a tool equipped with a cutting edge and activated by ultrasonic vibrations transmitted by a generator of such vibrations, moving a fastener chain beneath said tool with the cutting edge of said tool being positioned perpendicularly to the axis of said chain, applying said tool to said chain at intervals in time and for periods of time so as first of all to make a transversal cut through the two rows of linking components of the chain and thereafter to lift and detach the ensuing portion of these two rows by cutting the sewing threads of this portion which is then cut at the opposite end.

3,711,931
METHOD OF FORMING FASTENER STRIP

Harold A. Ladouceur, Livonia, and John H. Matthews, Royal Oak, both of Mich., assignors to Multifastener Corporation, Detroit, Mich.

Filed April 1, 1971, Ser. No. 130,335
Int. Cl. B23p 17/00
U.S. Cl. 29—412 13 Claims



This disclosure relates to a preoriented fastener system which is particularly suitable for piercing fasteners and the like which require high speed feeding systems and which must be oriented prior to securement. The method disclosed herein includes forming, as by rolling, a continuous metal strip having a cross section conforming to the cross section of the desired

fastener. The strip is then chopped into separate fasteners and a threaded aperture is formed in each fastener. The fasteners are then reassembled into a strip form by orienting the fasteners into serial alignment corresponding to the continuous metal strip and joined by readily frangible connector means, such as a pair of wires. The strip may then be coiled and delivered to the installation station.

The disclosed fastener includes a pair of parallel retainer grooves adapted to receive a pair of retaining rods or wires which secure the fasteners in the preoriented strip form. The disclosed embodiment of the fastener is a pierce nut, which includes a generally rectangular body portion having a piercing face and a pair of flanges at the opposite face; one flange extending from each end of the nut. The rod retaining grooves are generally perpendicular to the opposite sides of the nut and located between the flanges and the axis of the threaded aperture. In the disclosed embodiment, the rods are inserted in the retaining grooves and the fastener adjacent the grooves is deformed to retain the rods in the grooves.

3,711,932

APPARATUS AND METHOD FOR LAYING CROSS FILAMENTS AND THE LIKE

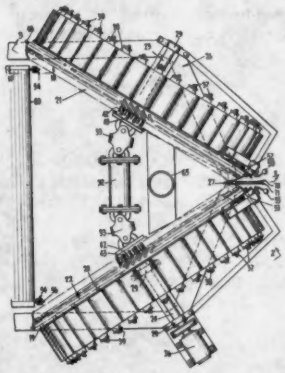
Harold Hilton Batt, Mentone, Victoria, Australia, assignor to Renhurst Industries Proprietary Limited, East Brighton, Victoria, Australia

Filed Aug. 31, 1971, Ser. No. 176,561

Claims priority, application Australia, Sept. 4, 1970, 2419/70

Int. Cl. B23p *17/00, 19/04*

U.S. Cl. 29—419 **12 Claims**



The invention is directed to apparatus for producing parallel cross filaments or threads consisting of two simultaneously rotatable wheels disposed at an angle to each other. The peripheries of the wheels are adjacent to each other at an single point while the peripheries diametrically opposite that point are spaced apart. Threads are fed from bobbins mounted on the wheels to thread outlets spaced around the wheel peripheries. Thread gripping means are positioned on the peripheries between the outlets, and the rotational phasing of the wheels is arranged so that, at the point where the wheel peripheries are adjacent, an outlet on the periphery of one wheel is directly opposite gripping means on the other wheel periphery. Actuating means are provided at the adjacent point and the gripping means are thereby actuated to grip a thread extending from an opposite outlet. As the wheels rotate, the thread gripped by the gripping means is drawn from the outlet to extend between the wheel peripheries. As each outlet moves in turn through the adjacent point with simultaneous rotation of the wheels, the threads are picked up and are drawn from the outlets to produce a series of parallel cross threads. Cutting blades are provided to sever the drawn out threads from the wheels.

3,711,933

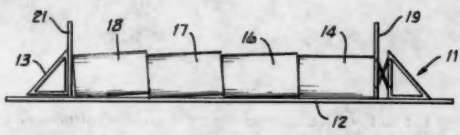
TANK ASSEMBLY METHOD AND APPARATUS

William R. Herdman, and Charles W. Sonnenberg, both of Indianapolis, Ind., assignors to Kennedy Tank & Manufacturing Company, Inc., Indianapolis, Ind.

Filed Feb. 24, 1971, Ser. No. 118,378

Int. Cl. B23p *19/00*

U.S. Cl. 29—431 **3 Claims**



Steel cylinders placed end-to-end on rollers, are pushed together between a headstock and tailstock, being rolled, pried and hammered, as and where needed.

3,711,934

METHOD OF PREPARING METAL FOIL/GRAPHITE FIBER/EPOXY RESIN LAMINATES

Carl F. Zorowski, and John D. Calfee, both of Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 17, 1970, Ser. No. 72,991

Int. Cl. B23p *9/00*

U.S. Cl. 29—445 **3 Claims**

Novel metallic foil/graphite fiber/epoxy laminates with compound curvature are fabricated through a unique fabrication process which includes the steps of preparing the laminate in the prepreg stage with the metallic foil layers overlapping the graphite layers, clamping the overlapped portion of the foil layers and pulling the laminate down over a mandrel of desired compound curvature, and curing the resulting curved laminate.

3,711,935

METHOD FOR INTRODUCING A PRESTRESS TO A CYLINDRICAL CONCRETE STRUCTURE

Ken-Ichi Hiraga, Tokyo, Japan, assignor to Taiser Kensetsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1970, Ser. No. 82,581

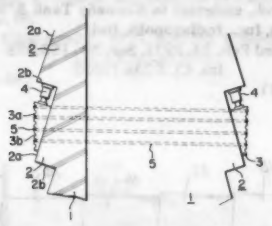
Claims priority, application Great Britain, Sept. 15, 1970, 44,093/70

Int. Cl. B21d *39/00*

U.S. Cl. 29—452 **10 Claims**

A method for introducing a prestress to a cylindrical concrete structure is disclosed, which is characterized by the steps of providing a desired number of step portions or notched portions having outer peripheral inclined faces, the thickness of which vary gradually either in the direction of generating lines of the cylinder structure or in the circumferential direction thereof, respectively. The inclined faces extend either along the circumferential direction or along the direction of the generating lines on the outer peripheral surface of the cylindrical structure. Wedge members are slidably disposed on the respective inclined faces and also jacks are provided for sliding the wedge members. Tensioning members are wound around the outer peripheral surfaces of the wedge members along the circumferential direction. The tensioning members wound around the outer periphery of the inclined

faces in the circumferential direction are tensioned by operating the jacks to cause the respective wedge members to slide



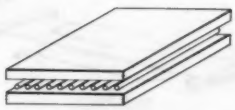
along the inclined faces; whereby a prestress is introduced to the cylindrical concrete structure.

3,711,936

METHOD FOR FORMING COMPOSITE ARTICLES FROM ALLOY IN TEMPORARY CONDITION OF SUPERPLASTICITY

Roy L. Athey, North Palm Beach, and Joseph B. Moore, Jupiter Tequesta, both of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 28, 1970, Ser. No. 101,742
Int. Cl. B23k *31/02*
U.S. Cl. 29—475 **4 Claims**



Articles, including such gas turbine engine hardware as airfoils and discs, are formed by forging alloys in a temporary condition of low strength and high ductility around suitable supporting materials or shapes, and forming a composite by diffusion bonding. The supporting materials may be retained within the finished article to provide, for example, a filament strengthened composite or may subsequently be leached therefrom to form hollow hardware.

3,711,937

METHOD OF ROLL BONDING TO FORM A TITANIUM CLAD ALUMINUM COMPOSITE

Frank Emley, Easton, Pa., assignor to Pfizer, Inc., New York, N.Y.

Filed July 21, 1971, Ser. No. 164,813
Int. Cl. B23k *31/02*
U.S. Cl. 29—487 **7 Claims**

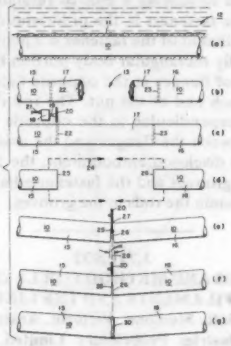
The process of cladding a sheet of aluminum or an alloy thereof with a sheet of titanium or an alloy thereof which comprises the steps of cleaning and removing oxide and other impurities and foreign matter from the surface of the aluminum and titanium sheets to be bonded, pre-heating said aluminum and titanium sheets together at a temperature of from about 500° to 1000°F., bringing the cleaned surfaces into momentary contact under a pressure sufficient to unite the surfaces and to effect a reduction (preferably in one or two passes) of from about 3–50 percent in a resultant composite sheet and post-heating the composite which is formed at a temperature of from about 500° to 1150°F.

3,711,938

METHOD FOR PULLING, ALIGNING AND BEVELLING ADJACENT SUBMERGED PIPE SECTIONS

Bobby J. Warren, and Paul K. Johnson, both of Houston, Tex., assignors to Fluor Corporation, Los Angeles, Calif.

Filed Oct. 26, 1970, Ser. No. 83,833
Int. Cl. B23p *11/00*
U.S. Cl. 29—493 **7 Claims**



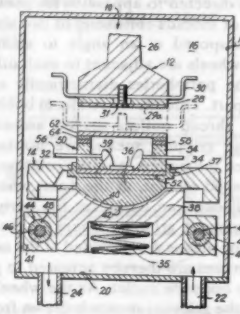
This invention provides a method for pulling, aligning and bevelling the end portions of submerged pipe sections prior to welding them together. he two pipe sections are pulled together in end-to-end relationship. Then, the ends are abuttingly aligned. By repeatedly cutting both abutting edges simultaneously, the edges are made to lie in substantially parallel planes, face-to-face, to form therebetween a joint with a welding gap characterized by close tolerances.

3,711,939

METHOD AND APPARATUS FOR SEALING

Milton Stoll, Old Post Road, Rogers Lake, Olde Lymne, Conn.

Continuation-in-part of Ser. Nos. 642,627, May 4, 1967, Pat. No. 3,479,487, Ser. No. 656,622, July 11, 1967, Pat. No. 3,551,127, and Ser. No. 712,578, Feb. 15, 1968, Pat. No. 3,551,645, and Ser. No. 558,142, June 16, 1966, Pat. No. 3,490,886. This application Nov. 10, 1970, Ser. No. 88,276
Int. Cl. B23k *31/02*
U.S. Cl. 29—494 **18 Claims**



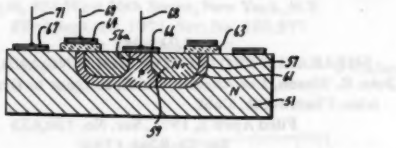
Methods and apparatus for sealing flat packs for electronic micro circuits within a sealing chamber and modulating the atmospheric pressure within the chamber to assist in the formation of the desired seal.

3,711,940

METHOD FOR MAKING MOS STRUCTURE WITH PRECISELY CONTROLLED CHANNEL LENGTH

David F. Allison, Los Altos, and Lewis K. Russell, San Jose, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 776,069, Nov. 15, 1968, Pat. No. 3,600,642. This application Feb. 8, 1971, Ser. No. 113,391
Int. Cl. B01j *17/00*
U.S. Cl. 29—571 1 Claim



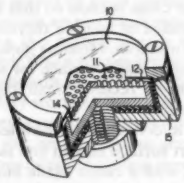
Method for making MOS structure with precisely controlled channel length by the utilization of an opening for two diffusion steps.

3,711,941

FABRICATION OF ELECTRET TRANSDUCER ELEMENTS USING LOW ENERGY ELECTRON BEAM

Gerhard Martin Sessler, Summit, and James Edward West, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 2, 1970, Ser. No. 85,883
Int. Cl. H01s *4/00*
U.S. Cl. 29—592 14 Claims



Thin film electrets for use in transducers, or the like, may be prepared by irradiating the film with controlled electrons applied by way of a beam. According to this invention, a low energy, focused beam is scanned over the surface of a thin film to produce individual electret areas. Beam energy is maintained low enough to insure that electron penetration is substantially less than the thickness of the film and high enough to insure that the beam is not deflected away from the foil before the charge reaches a sufficiently high level. As a result, a more uniform charge-density product is formed, the charge is bipolar, charge is retained more efficiently than with other processes, and charge time is shortened.

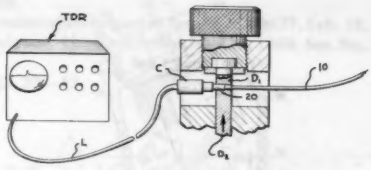
3,711,942

COAXIAL CONNECTOR CONTROLLED CHARACTERISTIC IMPEDANCE PROCESS

Charles Edward Reynolds, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 698,092, Jan. 4, 1968, Pat. No. 3,539,976. This application July 2, 1970, Ser. No. 30,052
Int. Cl. H02g *15/00;* H01p *11/00*
U.S. Cl. 29—593 5 Claims

A coaxial connector for use with signals haVing components of an appreciable frequency is disclosed which includes a forward connector plug structure having a pair of spring arms shaped relative to an underlying dielectric insert and a center conductor to provide impedance matching. The connector includes a structure which facilitates termination of shielded and coaxial cable and a method is disclosed for controlling the deformation of material of the connector to provide impedance matching relative to a circuit path of use.

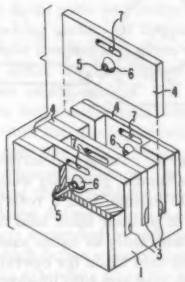


3,711,943

METHOD FOR CONSTRUCTING AN INTERACTION CIRCUIT FOR A MICROWAVE TUBE

Bertram G. James, Redwood City, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Sept. 3, 1970, Ser. No. 69,197
Int. Cl. H01s *4/00*
U.S. Cl. 29—600 6 Claims



A method for constructing an interaction circuit for a microwave tube is disclosed. In the method, a metallic block has an elongated open-sided channel formed therein. The channel is transversely slotted with an array of slots. An array of apertured conductive plates are inserted into the array of transverse slots and a conductive cover is brazed over the open side of the channel to define therein an interaction circuit for a microwave tube. The method may be employed for fabrication of a circuit for a multicavity klystron tube, a coupled cavity slow wave circuit, and for a meanderline slow wave circuit.

3,711,944

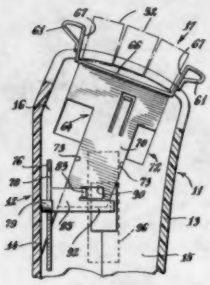
ELECTRIC DRY SHAVER

John F. Daniels, Bridgeport, Conn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,850
Int. Cl. B26b *19/10, 19/38*
U.S. Cl. 30—43.92 6 Claims

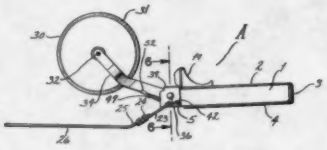
An electric dry shaver having a cutter head and cutter drive means disposed within a cutter head receptacle of a shaver casing. Manually operable means are provided for moving the

cutter head out of the receptacle clear of the cutter drive means and which means are further operable to return the



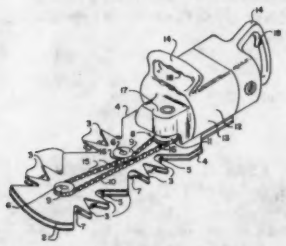
cutter head to the receptacle into operative engagement with the cutter drive means.

3,711,945
PIE CUTTER AND SERVER
Richard B. Cronheim, 7 Upper Barnes, St. Louis County, Mo.
Filed May 12, 1971, Ser. No. 142,679
Int. Cl. B26b *11/00*
U.S. Cl. 30—142 **9 Claims**



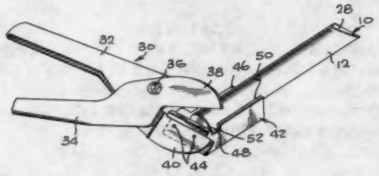
A household utensil for cutting and serving pies, cakes, and the like comprising a handle, generally wedge-shaped serving blade secured to said handle, and a rotary cutter mounted upon an arm which is pivoted upon said handle. Means for rocking said arm downwardly to cause said cutter to extend through an opening in said blade for operative purposes, and resilient means urging said arm into upward inoperative position.

3,711,946
TRIMMING APPARATUS
Glenn R. Troutman, 684 Valemont Drive, Penn Hills Twp., Allegheny County, Pa.
Filed April 12, 1971, Ser. No. 133,133
Int. Cl. B23d *49/00*; **B26b** *7/00*
U.S. Cl. 30—388 **5 Claims**



Trimming apparatus for prunning hedges and the like wherein at least one circular disc having teeth round its periphery is positioned adjacent a plate member and preferably between parallel, spaced apart plate members having first teeth along edge portions thereof. Said second teeth are positioned to at least partially overlap said first teeth as said circular discs are rotated by a drive means. Preferably said first teeth are positioned along opposite, substantially parallel edge portions and said second teeth overlap first teeth along each said parallel edge portion. In addition, a catching means is preferably provided for collecting the trimmings as they are cut and directing them to one side of the apparatus.

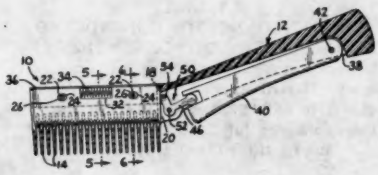
3,711,947
SHEARABLE PROTECTIVE MOLDING AND SHEAR
John R. Mason, Los Angeles, Calif., assignor to Dracon Industries, Chatsworth, Calif.
Filed April 2, 1971, Ser. No. 130,633
Int. Cl. B26b *17/00*
U.S. Cl. 30—179 **3 Claims**



Molding of uniform cross section so that it is economically extrudable, and is formed of flexible thermoplastic synthetic polymer composition material. Molding includes pressure sensitive adhesive tape on its under surface for attachment to side of automobile vehicle to receive small blows which could otherwise chip the paint.

The molding end is conveniently beveled by means of a shear having a support surface and an end stop to receive and position the molding, with a cutter blade moving angularly to the support surface to bevel the end of the molding.

3,711,948
HAIR TRIMMING DEVICE
James W. Ford, 1018 Elmwood, Wilmette, Ill., and Russell J. Nadherny, 821 Surrey Lane, Glenview, Ill.
Filed Feb. 26, 1971, Ser. No. 119,138
Int. Cl. B26b *13/26*
U.S. Cl. 30—212 **7 Claims**



A lightweight, easily manipulated hair trimming device especially adapted for use in self-trimming axillary hair from the human body. The device comprises a comb portion having

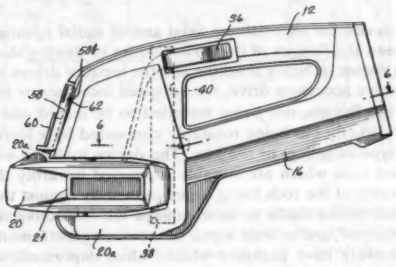
a fixed and movable cutting blade removably mounted therein, and a handle portion provided with an actuator for moving the movable blade through a restricted hair shearing stroke. The blades are maintained in operative relation with respect to one another by means which can be disassembled without the need of a tool thereby enabling easy cleaning of the blades and the comb portion.

3,711,949

CORDLESS ELECTRIC GARDEN TRIMMER WITH SAFETY LOCK MEANS

John S. Doyel, 404 West 20th Street, New York, N.Y.

Filed Sept. 15, 1971, Ser. No. 180,577
Int. Cl. B26b *15/00*
U.S. Cl. 30—264 **8 Claims**



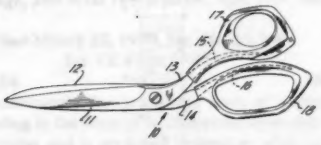
A cordless electric garden trimmer having electrically operated rotary cutting means and a safety cover comprising a pair of semicircular shrouds forming a hollow disk-shaped enclosure for the cutting means. The shrouds can be opened to expose the cutting means by hand operated spring biased triggers which also operate an electrical switch such that the electric motor driving the cutting means is on only when the shrouds are opened. When the triggers are released, the motor is cut off and the shrouds close. When closed, the shrouds can be locked in a safety storage position by a safety storage lock means to prevent exposing the cutting means when the trimmer is not in use, and to prevent accidental turning on of the motor which operates the cutting means.

3,711,950

REMOVABLE HANDLES FOR SHEARS OR THE LIKE

John J. Students, Roselle Park, N.J., assignor to J. Wiss and Sons Co., Newark, N.J.

Filed April 13, 1970, Ser. No. 27,660
Int. Cl. B25g *3/02*
U.S. Cl. 30—341 **4 Claims**



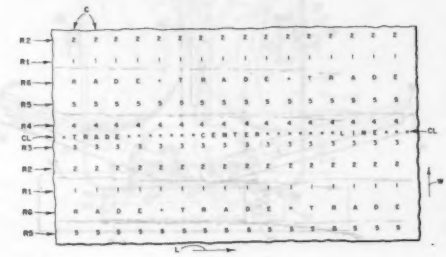
The shears or similar implements have removable handles, preferably made of molded plastic, on curvilinearly shaped shanks with tangs extending with continuously decreasing thickness past the area where the main finger pressure of the operation of the shears occurs. The method of molding the handles uses retractable cores which have the same curvilinear shape with continuously decreasing section as the tangs of the shears' shanks.

3,711,951

GARMENT PATTERN MARKING PAPER

Martin W. Seiler, 4501 South Santa Fe Avenue, Los Angeles, Calif.

Continuation-in-part of Ser. No. 528,637, Feb. 18, 1966, abandoned. This application June 26, 1968, Ser. No. 740,323
Int. Cl. A41h *3/00*
U.S. Cl. 33—12 **4 Claims**



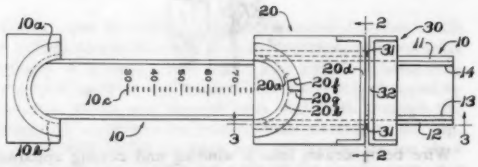
Pattern marking paper in which the working surface between opposite longitudinal edges is provided with a multiplicity of discrete numerical indicia located at reference points over substantially the entire working surface of the paper and equally spaced in rows extending along the length of the paper parallel to the longitudinal edges and in columns extending across the width of the paper perpendicular to the rows. A longitudinal reference marker divides the multiplicity of indicia into two equal parts and comprises a center line imprinted on the working surface of the paper exactly midway between the opposite longitudinal edges of the paper and extending along the entire length between and equally spaced from adjacent rows of the indicia. The center line is itself defined by discrete indicia elements which are spaced from each other by one-half the spacing between the numerical indicia, alternate center line indicia being aligned with the numerical indicia of adjacent columns. The numerical indicia of any row are identical throughout the row, and the numerical indicia of each column define several equally spaced series of progressive numbers separated by indicia which are not part of the series and which define equally spaced repetitive groups of distinctive indicia extending along the length of the paper.

3,711,952

BELT MEASURING APPARATUS

Alastair Justason, Toronto, Ontario, Canada, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Aug. 18, 1971, Ser. No. 172,626
Int. Cl. G01b *5/00*
U.S. Cl. 33—125 R **5 Claims**

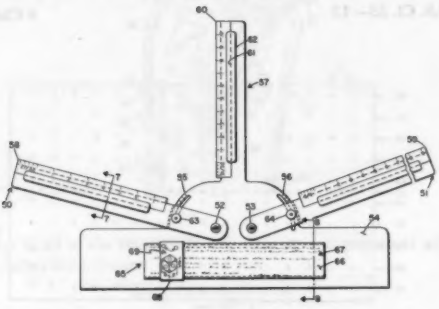


A device for measuring the circumference and section width of V-belts while the belt is maintained under tension. The belt is tensioned over two half pulleys, one of which is mounted on a slide with a releasable locking wedge maintaining the latter a fixed distance along the slide to hold the belt under tension. A belt length indicating scale is provided on the slide and one of the half pulleys has a section-width indicating scale thereon which cooperates with the length indicating scale to provide a direct reading of both length and width of the belt.

3,711,953
AXONOMETRIC DRAWING AID

Alfred J. Chandronnait, 19 Winnhaven Drive, Hudson, N.H.

Filed June 15, 1970, Ser. No. 46,018
Int. Cl. B43l *13/14*
U.S. Cl. 33—77 9 Claims

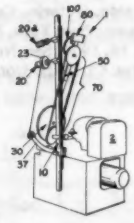


A slide rule aid or calculator for making axonometric drawings includes a scale with a slide having apertures or windows each of which aligns with a different row of numbers on the scale. The rows identify the angles of axis lines in the drawing, the relative lengths of the edges of a unit cube in the drawing and the ellipse templates to be used for drawing circles in the drawing. At each position of the slide along the scale, a different set of axis line angles, relative lengths of edges of a unit cube and ellipse templates are revealed in the apertures. The calculator may be used in conjunction with and may be part of a straight edge equipped with pivoting arms and a vertical arm to which scales selected from a bank of scales are removably attached and which are used for measuring distances along the axis line angles in the drawing. This provides a combined calculator and drawing instrument.

3,711,954
COILING WIRE METERING

Stephen A. Platt, 1100 Fulton Street, Grand Haven, Mich.

Filed Sept. 14, 1970, Ser. No. 71,819
Int. Cl. G01b *3/12, 5/04*
U.S. Cl. 33—132 11 Claims

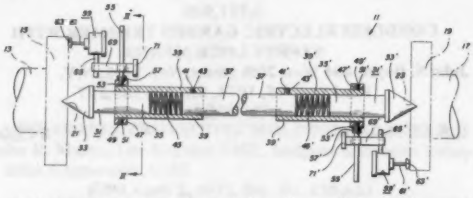


Wire being drawn into a winding and cutting apparatus feeds around a metering wheel of the metering apparatus and thereby causes it to rotate. A belt passing over a pair of pulleys has an exposed side which engages the side of the metering wheel such that rotation of the metering wheel also drives the belt around its pulleys. The belt includes cams which engage a switching mechanism disposed adjacent one of the pulleys. The switching mechanism then activates the cutting assembly and the wire is cut in appropriate lengths. The belt and pulleys are movable as an assembly with respect to the metering wheel relocating the point of contact between the belt and the metering wheel such that the length of wire being cut can be varied.

3,711,955
ALIGNMENT DEVICE

Ralph Holt, 3153 Hull Ave., Memphis, Tenn.

Filed Oct. 30, 1970, Ser. No. 85,339
Int. Cl. G01b *3/38*
U.S. Cl. 33—181 R 6 Claims



A device for ascertaining axial and/or radial misalignment between the flanges of the power outlet or driving shaft of a large engine or heavy machine and the input or driven shaft of a massive accessory drive, i. e., a speed increaser or the like, with the flanges, not being intended to be mated one to the other directly but being rotatably connected by a high speed gear-type coupling, or the like. The device includes a pair of pointed rods which are suitable supported inwardly thereof, the points of the rods being urged outwardly against the driving and driven shafts so as to engage the respective rotating axes thereof, and at least a pair of measuring instruments that respectively have plungers which, when depressed, actuate meter movements having dials calibrated in mils. The measuring instruments are suitably supported at opposite ends of the main body of the device so that the respective plungers thereof may engage the face portions of the flanges of the driving shaft and the driven shaft. The device is intended to be manually rotated about its longitudinal axis which causes the plungers to rotate in unison about the respective face portions of the flanges of the driving shaft and the driven shaft for sensing the quadrants of these flanges that are misaligned and indicating the magnitude of misalignment on the respective dials thereof.

3,711,956
METHOD OF OPERATING A FLUIDIZED BED REACTOR

Heinz Brauer, Janickestr. 65, 1000 Berlin 37, and Jochen Muhle, Stierstr. 4, 1000 Berlin 41, both of Germany

Filed Dec. 1, 1970, Ser. No. 94,002
Claims priority, application Germany, June 12, 1970, P 20 30 049.6
Int. Cl. F26b *3/10*; F27b *15/00*
U.S. Cl. 34—10 17 Claims

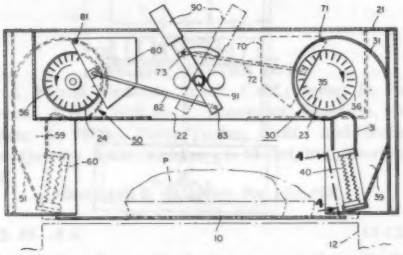
A fluidized bed reactor, and a method of operating thereof, wherein fluidized material passes downwards and the fluidiz-

ing material passes upwards in countercurrent, having a plurality of superposed plates with common orifices for use in catalytic reactions, substance transfer processes and/or heat transfer processes.

3,711,957
SHRINK TUNNEL

Herbert K. Carver, Jr., Oakford, Pa., assignor to J. B. Dove Inc., Levittown, Pa.

Filed April 19, 1971, Ser. No. 135,066
Int. Cl. F26b *3/00*
U.S. Cl. 34—31 **15 Claims**



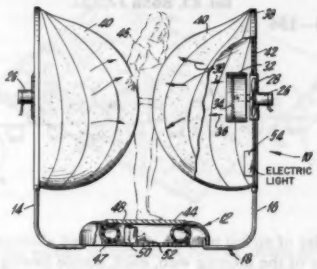
A shrink tunnel, for shrinking plastic wrapping film about a package as it moves along on a conveyor, has two blower-heater units within its housing, one at each side of the conveyor. The blower-heater units are so constructed and so positioned that each delivers narrow vertical laminar streams of heated air diagonally and slightly downwardly across the shrink zone in the tunnel and across any package which is passing therethrough on the conveyor. The heated streams of air projected from the two blower-heated units flow in opposite directions, with the streams of air of one blower-heater being located in vertical planes which are parallel and laterally adjacent to the vertical planes of the streams of air of the other. The heated streams of air projected from each blower-heater are sucked into an intake duct of the other, are reheated, and projected back through the shrink zone and across the package which may be passing therethrough. Heated air is thus caused to flow back and forth and in so doing inpinges directly upon all sides and upper surfaces of any film-wrapped package which may be passing through the tunnel. The velocity at which the heated air moves is not high, and as the air moves across the shrink zone from the heater of one blower to the intake duct of the other, the air which impinges upon the package tends to follow the contour of the package as it is pulled on and into the intake duct of the other blower.

3,711,958
DRYING DEVICE

Marc D. Lepage, 209 West 109th Street, Apt. 3-W, New York, N.Y.

Filed March 25, 1970, Ser. No. 22,540
Int. Cl. F26b *19/00*
U.S. Cl. 34—88 **16 Claims**

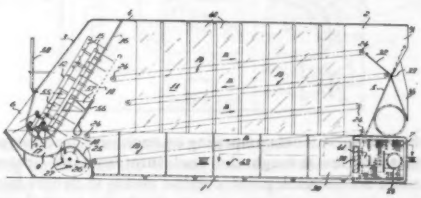
A dryer, particularly for drying the body of a person, includes a toweling in the form of an absorbent material which is preferably porous and is arranged around or adjacent fan or blower in a position such that the fan may direct a drying fluid which is advantageously heated air against one side of the toweling while an article or a person is arranged at the opposite side in contact with the towelling so as to be dried thereby. The toweling advantageously includes one or more layers or a single layer having pores preferably such that there is some degree of flow-through of the air but there is sufficient resistance to the air flow so that the toweling bellows out and the drying surface is enlarged. In one arrangement the dryer includes a platform or stand with fan-supporting brackets on each side of the stand, each of which support a generally hemispherical-shaped toweling around the discharge of the fan and a heater associated therewith. The size of the toweling is such that when the fans are operated the two towelings balloon outwardly from opposite sides of the platform and intersect centrally over the platform at a position in which a person would normally stand to be dried. The platform advantageously includes means for turning on and off the fan or heater and for illuminating the toweling with an ordinary white or a multicolored light as desired.



3,711,959
CROP DRYING SYSTEMS

Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland

Filed June 19, 1970, Ser. No. 47,258
Claims priority, application Netherlands, June 19, 1969, 6909348
Int. Cl. F26b *19/00*
U.S. Cl. 34—102 **22 Claims**

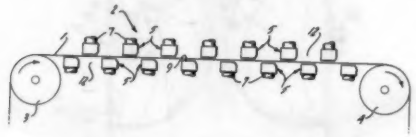


A large capacity crop drier has an elongated chamber which may include transparent wall and roof partitions to admit solar radiations. A feeding device which may include a doser conveys crop to be dried into the chamber where it is chopped by retractable knives and carried back and forth through the chamber on superimposed endless belts starting at the top. The lower belt discharges back into the feeding device via a one-way conveyor closing the path of the drying crop. Air which may be heated is introduced into the chamber under the lowest belt opposite the feeding device and is exhausted on the same side that it was introduced or over walls under a raised roof. When desired by movement of a rear flap which may carry a conveying belt, the drier crop is discharged from the chamber via the flap to a blower conveyor. In a modification, the chamber has a moving belt floor, a blower which displaces air to under the floor and up through the chamber, and a mechanism for stirring crop in the chamber which automatically rides back and forth on tracks provided in the chamber.

3,711,960
WEB DRYER

Wm. F. Overly, Winneconne, and Kenneth J. Pagel, Neenah, both of Wis., assignors to Overly, Inc., Neenah, Wis.

Continuation-in-part of Ser. No. 89,744, Nov. 16, 1970, Pat. No. 3,650,043. This application Aug. 26, 1971, Ser. No. 175,052
Int. Cl. B65h *17/32*
U.S. Cl. 34—156 3 Claims

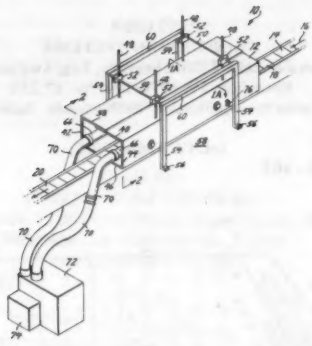


A plurality of airfoil nozzles are disposed alternately on opposite sides of the moving web, each nozzle having a flat face generally parallel to the web and ending in a substantially 90° corner of the plenum chamber.

3,711,961
HEAT SHRINK TUNNEL

Jacob Spiegel, and Arthur Hurewitz, both of Philadelphia, Pa., assignors to Gilbreth Company, Philadelphia, Pa.

Filed Nov. 25, 1970, Ser. No. 92,623
Int. Cl. F26b *19/00*
U.S. Cl. 34—218 6 Claims

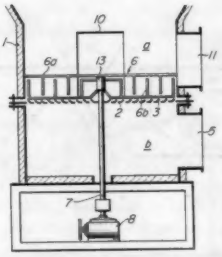


A heat shrink tunnel comprising an enclosure, a conveyor to conduct articles through the enclosure from an upstream point to a downstream point, conduit means to deliver hot air to the enclosure, partition means to divide the conduit means into first and second paths, said first path being relatively long as compared with said second path, a source of hot air, means to force the hot air in a generally upstream direction in the two paths of the conduit means, a first slit in the conduit means at an upstream point, communicating with said enclosure to allow hot air in the first path to enter the enclosure in a narrow band and a second slit in the conduit means spaced downstream of the first slit and also communicating with the enclosure to allow hot air to enter the enclosure in a narrow band at a point that is downstream from the first slit whereby the air entering through the second slit and at the downstream location is relatively hot. In many instances the air entering through the first slit at the upstream location is somewhat cooler than the air entering through the second slit, and in such instances the articles being transported by the conveyor are first subjected to a warm zone and then as the articles move downstream are subjected to a hot zone in order to exert a shrinking effect upon a thermoplastic synthetic resin that is wrapped on the articles. Hot spots adjacent the top of the tunnel are avoided since the warm or hot air is admitted to the tunnel in a narrow band that is normally not directed toward the top of the tunnel.

3,711,962
FLUIDIZED DRYING APPARATUS

Masaichi Fukuyo, Shizuoka-ken, Japan, assignor to Kabushiki Kaisha Okawara Seisakusho, Harbara-gun, Shizuoka-ken, Japan

Filed Dec. 15, 1970, Ser. No. 98,397
Int. Cl. F26b *17/10*
U.S. Cl. 34—57 D 2 Claims

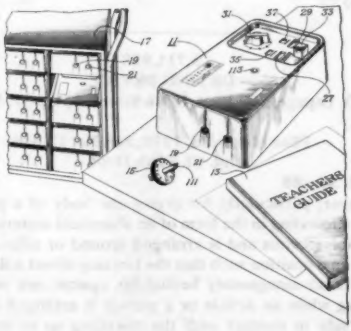


A fluidized drying apparatus having a substantially cylindrical casing, a perforated plate provided in said casing which divides the interior of said casing into an upper solid fluidizing chamber and a lower windbox chamber and which has formed therein a number of perforations each being inclined with respect to the axis of said casing so as to direct a drying gas passing therethrough in a direction at an acute angle to the surface of said perforated plate and means for feeding a granular material to be dried into said fluidizing chamber. A breaking member is provided in the casing above the perforated plate, which is rotated during operation of the apparatus to break lumps of material agglomerating on said perforated plate.

3,711,963
APPARATUS FOR PROGRAMMED INSTRUCTION AND TESTING

Jack B. Hunnicutt, George W. Plumly, both of Fort Worth, Tex., and Troy R. Radford, Fort Worth, Tex., assignors to Mycom Corp., Fort Worth, Tex.

Filed Dec. 6, 1971, Ser. No. 204,829
Int. Cl. G09b *7/08*
U.S. Cl. 35—9 A 28 Claims



An improved programable system for effecting automated teaching for use in conjunction with the problem and answer material wherein a plurality of answers are provided for each problem arranged in accordance with a predeterminable program, including encoding means, apprising means, display

means for problem and correct answers, and advancing means having a movable bolt; characterized by a bolt moving means that incorporates features that require the student to be irrevocably committed before actuating the system and that cannot be cheated by the student; and incorporating improved, lightweight pawls as gear engaging means carried by the bolt in conjunction with a gear reduction means between the bolt and the program means such that some of the stringent demands on the mass, acceleration and deceleration, and the angle and time of travel of the bolt are lessened. Also disclosed are specific preferred structural embodiments, including a structure that enables the armature of a low current solenoid to effect, reliably, impact engagement of the lightweight pawls.

3,711,964

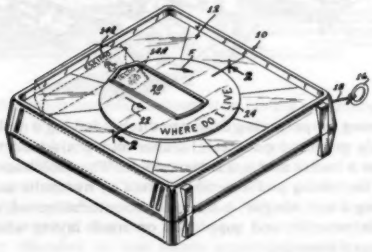
ASK AND ANSWER TOY

Henry J. Folson, Redondo Beach, Calif.; James D. Hegel, Torrence, Calif.; William T. Hosokawa, Pasadena, Calif.; William B. Pester, Palos Verdes, Calif.; and Irwin C. Poter, Quinter, Kans., assignors to Mattel, Inc., Hawthorne, Calif.

Filed April 8, 1971, Ser. No. 132,468

Int. Cl. G09b *3/00*

U.S. Cl. 35—8 A **11 Claims**



A phonograph toy with a pointer wheel that can be turned so that a pointer thereon points to a picture that represents a question, and which automatically selects a record groove that asks the question when the phonograph is played. The pointer can be slid on the wheel to uncover a picture that represents the answer to the question, and the pointer then also selects another record groove that answers the question. The record is a disc with leadin groove portions spaced thereabout, and the particular groove that will be played is determined by the rotational position at which the disc stops during winding of a spring prior to playing. As the disc record rotates in reverse during spring winding, it rotates an index member with a helical ramp. The rotating helical ramp raises and then drives a moveable stop so the stop can contact another stop on the pointer and prevent any further reverse record rotation. During forward record rotation, when a groove is played, the ramp lowers the moveable stop so it is clear of the pointer stop.

3,711,965

EDUCATIONAL TOY FOR TEACHING ARITHMETIC

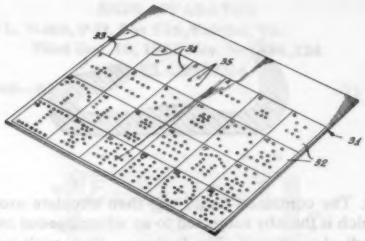
Eldon L. Janssen, 3815 Los Feliz Blvd, Apt. 1, Los Angeles, Calif.

Filed June 18, 1970, Ser. No. 47,457

Int. Cl. G09b *23/02*

U.S. Cl. 35—31 D **11 Claims**

An arithmetical teaching toy for division and multiplication employing a board having numbered dividend areas thereon and separate divisor pieces to be interlocked with the board areas by means of a peg and hole arrangement. Each numbered piece and numbered area has a corresponding number of pegs or holes arranged so that only the pieces whose numbers are divisors of a particular area may be individually inserted into and interlocked therewith, the peg insertion physically illustrating the arithmetic concept that the divisor piece number "goes into" the dividend area number. The exterior



outline of the pieces is such that two or more given divisor pieces can interlock with a given dividend area only if the product of the piece numbers is not greater than the number of the area.

3,711,966

GEOGRAPHICAL GAME

Frank Drcsak, 5440 Harold Way, Apt. No. 8, Los Angeles, Calif.

Filed Sept. 1, 1970, Ser. No. 68,619

Int. Cl. A63f *3/04*

U.S. Cl. 35—40 **2 Claims**

The disclosed embodiment of the game comprises a board having outlines of the United States and the 50 States and a plurality of state pieces which are placeable in the state outlines. At the state capital of each piece is a hole for insertion therein during play of the flag of that state. Prior to play all the flags are mounted in a frame and on the frame are 50 tongues, one for each state. On one side of the tongue is the name of the state while on the other side of the tongue is the name of the capital of the state.

3,711,967

FOOTWEAR FOR FOOT TREATMENT OR MAINTENANCE

Carl-Johan Candelius, Kampementsgatan 14, 11538 Stockholm, and Thord Sundstrom, Karin Mansdietters vag 8, 12235 Enskede, both of Sweden

Filed April 26, 1971, Ser. No. 137,500

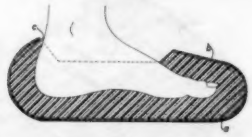
Claims priority, application Sweden, April 30, 1970, 6005/70

Int. Cl. A43b *1/10*

U.S. Cl. 36—4 **2 Claims**

A footwear for foot treatment or maintenance comprises a liquid absorbing inner portion of a material having substantially the same characteristics as polyeter foam plastics shaped

to enclose a foot and a liquid proof outer portion or layer. A liquid such as a foot-salt dissolved in water is contained in the inner portion. When the footwear is put on a walking person the inner portion is periodically compressed and allowed to



expand. The contained liquid will then circulate around the foot which is thereby subjected to an advantageous and effective medical treatment. The footwear, thus, replaces earlier foot treatment by using a bowl filled with a liquid. It can be designed as a simple article for non-recurring use.

3,711,968

DREDGE CUTTER HEAD WITH COUNTERBALANCING

Willem Jan van Heijst, Delft, Netherlands, assignor to N. V. Industrieele Handelscombinatie, Holland

Filed Nov. 27, 1970, Ser. No. 93,011

Claims priority, application Netherlands, Nov. 28, 1969, 6917936

Int. Cl. E02f *3/90*

U.S. Cl. 37—67 **6 Claims**

A cutter dredger with a rotary cutter adjacent the mouth of a suction pipe, in which a second vibratory system balances the first vibratory system comprised by the rotating cutter and its shaft when they encounter resistance during dredging. The drive is applied to the two vibratory systems at their point of interconnection, to reduce the strain on the drive train. The drive may be mechanical, intermediate the length of a torsion shaft, or hydraulic. If hydraulic, a common pump drives motors individual to the two vibratory systems and accumulators are disposed between each pair of the pump and motors. In a compact hydraulic embodiment, the drive and the two driven systems are concentrically interconnected.

3,711,969

SHOE STIFFENER AND METHOD OF USING THE SAME

Aaron Weinstein, Marblehead, and Frank Scourtas, Newbury, both of Mass., assignors to Pacesetter Products, Inc., Salem, Mass.

Division of Ser. No. 732,833, May 29, 1968. This application Dec. 18, 1970, Ser. No. 599,652

Int. Cl. A43b *13/42*

U.S. Cl. 36—68 **9 Claims**

A thermoplastic shoe stiffener and stiffener blank comprising a non-fabric-containing sheet of thermoplastic polyvinyl chloride having a molding temperature of between 140°F and 350°F and containing an impact modifier, preferably linear polyethylene or linear chlorinated polyethylene, in an amount between 3 and 18 percent by weight of the resin and a heat stabilizer in an amount equal to at least 1 percent by weight of the resin. The polyvinyl chloride contains a lubricant and may contain a plasticizer and filler. The stiffener is hard and tough and highly crush resistant but not brittle. It has excellent molding properties at the aforesaid temperatures, is water and mold proof, has a high flexure and tensile strength, an excellent memory for its molded shape upon deformation and an excellent recovery of its crush resistance after being crushed and then returned to its original shape. Unlike resin impregnated fabrics, strength is not affected by the direction in which it is cut and it is equally stretchable in all directions. It is coated on one side with a layer of heat activatable adhesive and on the other side with a layer of flock or a layer of heat activatable adhesive.

ERRATUM

For Class 37—67 see:
Patent No. 3,711,968

3,711,970

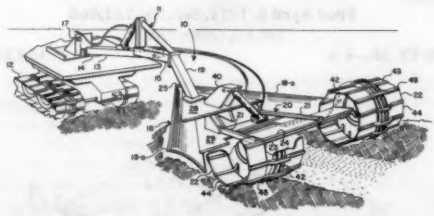
HYDRAULICALLY CONTROLLED DITCHING PLOW HAVING A COUNTERBALANCING WHEELED TRAILER

George M. Briar, Bristol, Pa., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Continuation of Ser. No. 702,690, Feb. 2, 1968, abandoned. This application April 15, 1970, Ser. No. 28,214

Int. Cl. E02f *5/02*

U.S. Cl. 37—98 **7 Claims**



A device for preparing drainage ditches having a moldboard assembly mounted on a steel frame and positioned thereon between a trailer and a tractor vehicle. The moldboard is arranged for raising and lowering thereof by hydraulic actuators operating a split tongue, is uniquely counterbalanced, and the trailer is movable and supported on track laying wheels for low ground pressure.

3,711,971

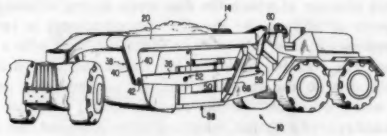
LARGE CAPACITY SCRAPER UNIT CONSTRUCTION

William E. Martin, P.O. Box 187, Kewanee, Ill.

Continuation-in-part of Ser. No. 77,659, Oct. 2, 1970, abandoned. This application Nov. 2, 1971, Ser. No. 194,897

Int. Cl. E02f *5/00*

U.S. Cl. 37—124 **41 Claims**



The largest capacity earth moving scrapers may be loaded to their rated capacity using a single powered traction unit as opposed to the usual arrangement wherein a towing traction unit is assisted by a pusher traction unit to fully load the scraper bowl.

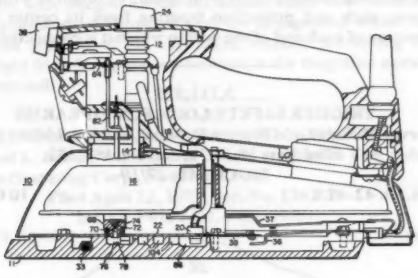
The achievement of the foregoing involves a combination of increasing available tractive force and reducing loading resistance. Tractive force is increased by a rigid integration of a traction unit with the scraper frame for pushing rather than towing. Decreased loading resistance is made possible by mounting the scraper bowl for transverse tilting (canting) movement relative to the scraper frame whereby blade draft resistance may be selectively controlled by the operator and particularly during that portion of an excavating operation as the payload approaches rated capacity.

Selective bowl cant is, in turn, dependent upon a constructional configuration which will stabilize the bowl, laterally, in the various bowl cant positions and particularly against yaw forces. The constructional configurations herein illustrated for stabilizing the bowl include widely spaced, overhead frame members and additional stabilizing structure positioned outside the peripheral confines of the bowl for transferring lateral forces to the scraper frame.

3,711,972
STEAM IRON

Gerard H. Risacher, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 5, 1971, Ser. No. 195,927
Int. Cl. D06f *75/06*
U.S. Cl. 38—77.83 **6 Claims**

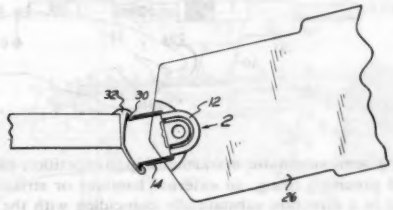


The invention discloses a steam iron having a primary steam generating chamber for the generally continuous generation of steam and a separate auxiliary steam generating chamber for a manually controlled intermittent generation of a substantially larger volume of steam. The auxiliary chamber is connected to the primary chamber via a "S"-shaped steam path with the primary chamber also being downstream from the auxiliary chamber so that steam generated in the auxiliary chamber must pass through the "S"-shaped path and into the primary chamber before being distributed for discharge through apertures in the soleplate. The auxiliary chamber and the temp responsive bimetal control regulating the temperature of the iron are in close proximity to each other so the heat loss in the area of the soleplate bounding the auxiliary chamber, in instances when there are successive demands for the larger generation of steam which tend to deplete the heat from the auxiliary chamber, can be rapidly sensed and quickly replenished by actuating the heater.

3,711,973
DISPLAY MARKER CLIP

Robert J. Slavsky, Lathrup Village, Mich., assignor to Shaw & Slavsky, Inc., Detroit, Mich.

Filed Nov. 30, 1971, Ser. No. 203,373
Int. Cl. G09f *3/18*
U.S. Cl. 40—11 R **9 Claims**

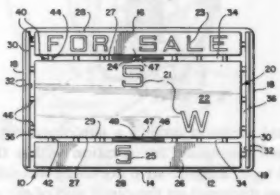


A spring clip is provided with retaining means for holding an associated attention directing card and is also provided with sides having flanges for snapping into grooves of a conventional C-shaped price tag molding with which the clip is used.

3,711,974
SIGN APPARATUS

Bernard L. Webb, P.O. Box 516, Fairfax, Va.

Filed Dec. 18, 1969, Ser. No. 886,224
Int. Cl. G09f *7/14*
U.S. Cl. 40—63 **11 Claims**

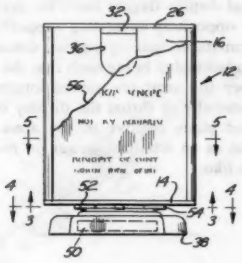


A sign is made of a thin relative rigid plastic material which is vacuum formed and which has indicia bearing portions drawn outward from a base and indicia drawn outward from the indicia receiving portion and indicia portions, and by ridges and projected reinforcement portions which extend between spaced indicia bearing portions and between those portions and ridges. A sign post is a square cross section aluminum tube, which fits over a square wooden stake and rests upon the ground.

3,711,975
RECEPTACLE PACKETED SUGAR, CONDIMENTS AND THE LIKE

Robert C. Downing, Stoneham, Mass., assignor to Howard Johnson Company, Dorchester, Mass.

Filed Nov. 5, 1970, Ser. No. 87,143
Int. Cl. G09f *11/02*
U.S. Cl. 40—77.8 **4 Claims**

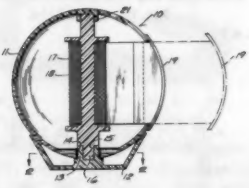


A structure having a base with a receptacle mounted thereon for rotation about a vertical axis. The base is weighted and the receptacle has a bottom wall rotatably connected to the base and side walls extending vertically therefrom which form an open top enclosure. The side walls are inwardly concave and at their opposite vertical edges there are lateral, vertically extending grooves adapted to receive the edges of cards of greater width than the straight line distances between the grooves with the portions therebetween displaced inwardly in engagement with said concave wall.

3,711,976
SPHERICAL SOUVENIR RECEPTACLE

Joseph J. Allen, 4181 No. 19th Place, Milwaukee, Wis.

Filed Jan. 27, 1971, Ser. No. 110,138
Int. Cl. G09f 11/30
U.S. Cl. 40—82 1 Claim

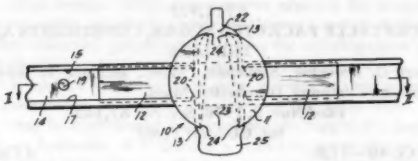


A spherical element having a subjoined rotatable base, a spool element journalled for rotation within the sphere and fixed to said base, a photo strip normally wound on said spool, handle means disposed on the outer end of the photo strip for withdrawing the strip for viewing, and retraction of said strip to be effected by manual reverse rotation of said base.

3,711,977
DIMENSIONAL DISPLAY FLAGGER

Siegfried C. Blankenhorn, Naperville, Ill., assignor to Blankenhern Display, Inc., Chicago, Ill.

Filed Jan. 8, 1971, Ser. No. 104,863
Int. Cl. G09f 1/00
U.S. Cl. 40—124.1 10 Claims



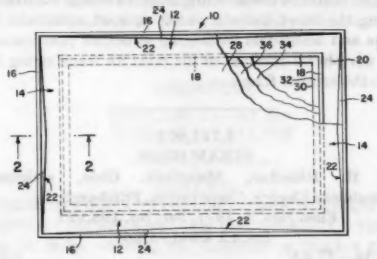
A dimensional display flagger has a normally flat-lying display body and oppositely extending supporting arms with a flexible but form-stable spacing portion connecting the body and arms, the relationship being such that the spacing portion will buckle when the arms are moved longitudinally toward one another, whereby to thrust the display body into a substantially spaced plane relative to the arms. This device is especially useful as an attention-getter on merchandise sales shelves, and the like.

3,711,978
ARTICLE DISPLAY FRAMES AND THEIR ASSEMBLY WITH DISPLAY ARTICLES

E. Henry Conrad, Box 537, Weaverville, N.C.

Filed Sept. 14, 1970, Ser. No. 71,905
Int. Cl. G09f 1/12
U.S. Cl. 40—152 11 Claims

A frame for a picture or the like including opposed pairs of frame sides, each side including a peripheral wall and associated means for supporting an article within the frame opening, each peripheral wall of each side having an inwardly sloping projection adapted to serve for guiding a backing board into place within the frame and to overlie the edges of

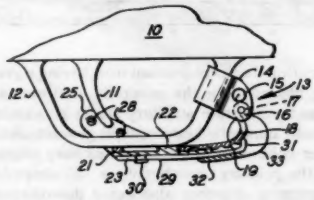


the backing board after it is in place, to retain it within the frame, each said projection tapering from its center in the direction of each end of the wall to which it is connected.

3,711,979
TRIGGER SAFETY LOCK FOR FIREARMS

Hervey W. Small, c/o Warren D. Small, Salmon, Idaho

Filed June 30, 1971, Ser. No. 158,152
Int. Cl. F41c 27/10
U.S. Cl. 42—1 Y 10 Claims

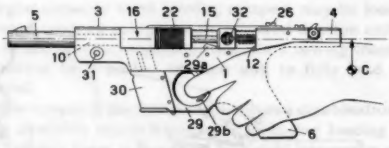


A trigger safety lock for firearms consists of an attachment to the customary trigger guard. The trigger locking element is carried on a first component which has a guided sliding connection with a second component firmly attached to the trigger guard. Interengaging teeth on the first and second components secure the trigger locking element in an active or inactive position relative to the trigger, and yielding means maintain the teeth releasably engaged.

3,711,980
SEMI-AUTOMATIC MARKSMANSHIP COMPETITION PISTOL FOR RAPID PRECISION FIRING

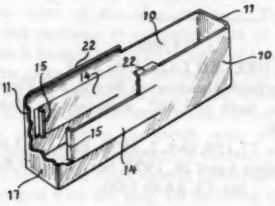
Roberto Palama', via Cavalcanti, 21-Vercelli, Italy

Filed Sept. 21, 1970, Ser. No. 73,786
Int. Cl. F41c 5/00, 11/00; F41d 5/00
U.S. Cl. 42—16 3 Claims



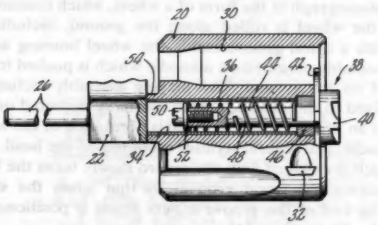
In a semi-automatic marksmanship competition pistol for rapid precision firing, an external hammer or striking mass slides in a direction substantially coinciding with the axis of the barrel of the pistol and cooperates with at least one firing pin carried by an obturator aligned with said hammer or striking mass.

3,711,981
CARTRIDGE MAGAZINE
Louis W. Seecamp, 561 Whitney Avenue, New Haven, Conn.
Filed Oct. 29, 1970, Ser. No. 84,957
Int. Cl. F41c 25/02
U.S. Cl. 42—50 7 Claims



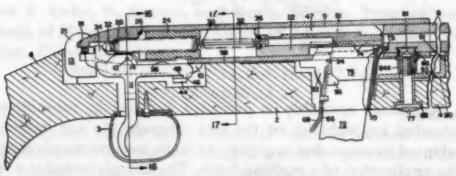
A box-magazine for cartridges in which the side walls are provided with integral knock-out fingers which have inwardly bent projections at their free ends for engagement within the extractor grooves of the cartridges, thereby preventing the cartridges from being thrown forward in the magazine against the front wall.

3,711,982
REVOLVER HAVING REMOVABLE CYLINDER
Richard L. Baker, Wallingford, Conn., assignor to Colt Industries Operating Corp., New York, N.Y.
Filed April 22, 1971, Ser. No. 136,339
Int. Cl. F41c 1/00; F42b 39/04
U.S. Cl. 42—62 1 Claim



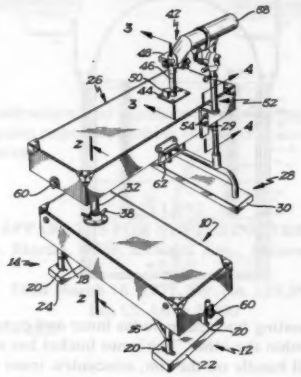
A revolver includes a frame and a crane pivotally connected to the frame. Upon the crane is releasably mounted a cylinder. The crane may be pivoted between a closed position, in which the cylinder is disposed within the frame in firing position, and an open position, in which the cylinder is free of the frame and may be quickly removed from the crane. The cylinder incorporates a ratchet-ejector mechanism which is operated to eject spent cartridges within the chambers of the cylinder by moving the cylinder over a projection integral with the frame.

3,711,983
AUTOLOADING FIREARM
Harold D. Allyn, 103 Garfield Street, Springfield, Mass.
Continuation-in-part of Ser. No. 792,694, Jan. 21, 1969, Pat. No. 3,584,533. This application June 10, 1971, Ser. No. 151,694
Int. Cl. F41c 23/00
U.S. Cl. 42—75 C 4 Claims



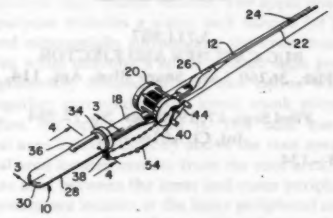
An autoloading firearm of the blowback type wherein the assembled components are brought into operative relationship by the tightening of an assembly screw at final assembly.

3,711,984
PORTABLE SHOOTING BENCH
Gordon A. Dyer, Route No. 1 Box 742D, and Scoby N. King, Route No. 1 Box 308, both of Excelsior, Minn.
Filed May 3, 1971, Ser. No. 139,344
Int. Cl. F41c 29/00
U.S. Cl. 42—94 10 Claims



This invention relates to a portable collapsible shooting bench. The bench of this invention collapses into a suitcase-like box for storage or transportation. The bench is comprised of a seat member; a connecting member for connecting seat to bench; a bench member; and a gun support. As set up the seat unit may be adjusted for height and for a right or left hand shooter via the connecting member. The seat member is secured to the bench member so that when the shooter sits on the seat, his weight is employed in steadying the unit. The gun support is secured to the bench member and is adjustable for height and angular displacement. Leveling means are also provided.

3,711,985
FISHING ACCESSORY AND METHOD
Theron C. Winters, 1337 Wayburn, Grosse Pointe, Mich.
Filed Feb. 3, 1971, Ser. No. 112,184
Int. Cl. A01k 97/06
U.S. Cl. 43—25.2 7 Claims

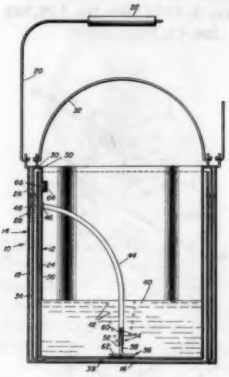


A fishing accessory for holding fishing lines during baiting and for attachment to a fishing pole to store hooks and sinkers when not in use, comprising an elongated, hollow, cylindrical casing closed at one end and a hollow tubular member adapted to be slidably inserted within said casing. The casing is open at the other end to receive the hooks and sinkers, to fit over the handle of the fishing pole with which the accessory is used, and to allow the insertion thereinto and removal therefrom of the tubular member by means of which said hooks and sinkers may be secured within the casing.

3,711,986
AERATED BAIT KEEPER

Harry A. Andersen, 1165 8th Terrace, N., Naples, Fla.

Filed Nov. 18, 1971, Ser. No. 199,932
Int. Cl. A01k 97/04
U.S. Cl. 43—57 7 Claims



A pair of nesting buckets includes inner and outer buckets placed one within the other. The inner bucket has an integral top rim, a bail handle on the rim, concentric inner and outer walls depending from the rim, and a floor on its inner wall. A manually operable air valve extends through the bucket inner wall. An air inlet tube extends from an opening through the inner wall to the annular space between the inner and outer walls. The other end of the air inlet tube extends to near the floor of the inner bucket, and has some spirally located different size openings through its tube wall near the open bottom of the tube. An aerating air escape valve consists of a solid rod lifting snugly yet rotatably within the open bottom end. This rod has a transverse slot extending from its top end to below the air escape holes in the tube, the slot stopping short of the bottom end of the tube.

The outer bucket has an outer wall of a diameter somewhat larger than the outer wall of the inner bucket, and also has an inner concentric wall extending upwardly from its bottom floor, the diameter of this outer bucket inner wall being intermediate the diameters of the inner bucket's inner and outer walls. Water is placed in the annular space between the outer buckets inner and outer walls, to near its top. This water acts as a seal when the inner bucket, with its bait water, and bait, is placed down in the outer bucket, trapping and somewhat compressing the air beneath the inner bucket.

3,711,987
BUG CATCHER AND EJECTOR

Edwin J. Fisk, 36260 Lake Shore Blvd. Apt. 114, Eastlake, Ohio

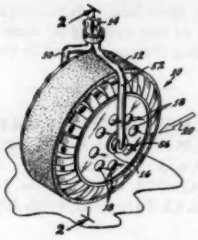
Filed Sept. 17, 1970, Ser. No. 72,984
Int. Cl. A01m 5/02
U.S. Cl. 43—134 2 Claims

A suction type bug catcher and ejector comprising a manually operated piston in a cylinder having a bug confining cell which holds bugs captive that are caught with the air drawn into the cylinder by the inward movement of the piston. An air vent is provided to exhaust the air from the cylinder and bug confining cell when moving the piston outwardly to reset it for a subsequent suction stroke. The bugs captured are ejected from the confining cell when the piston is moved forcefully outward while the vent is closed.

3,711,988
WHEELED TALKING TOY

William F. Summerfield, Huntington Beach, and Fleet E. Nuttall, Los Angeles, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 77,158, Oct. 1, 1970, Pat. No. 3,667,723.
This application April 26, 1972, Ser. No. 247,559
Int. Cl. A63h 5/00
U.S. Cl. 46—114 5 Claims

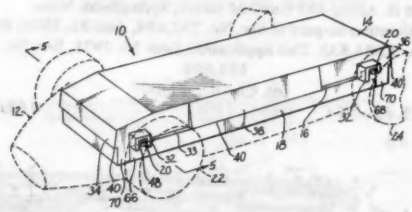


A toy phonograph in the form of a wheel, which continually plays as the wheel is rolled along the ground, including a record with a spiral groove inside the wheel housing and a playing assembly mounted on a handle which is pushed to roll the wheel on the ground. The playing assembly includes a bracket fixed to the handle, a head rotatably mounted on the bracket at an axis eccentric to the axis of rotation of the wheel on the handle, and several styluses mounted on the head. The stylus which is engaged with the record slowly turns the head while tracking the spiral groove, so that when the stylus reaches the end of the groove a next stylus is positioned to enter the leadin portion of the groove.

3,711,989
CHASSIS ASSEMBLY

Edwin Nielsen, Oceanside, N.Y., and Vincent Carella, Queens Village, N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Oct. 27, 1971, Ser. No. 193,065
Int. Cl. A63h 17/00
U.S. Cl. 46—201 19 Claims



A chassis assembly is provided for use in subminiature wheeled toy vehicles or the like wherein the toy vehicle is adapted to coast due to gravity or to its own momentum upon the application of a pushing force. The chassis includes a relatively flat slug adapted to be secured to the underside of a

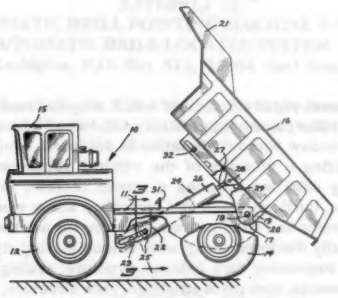
vehicle body and has on its bottom surface a pair of downwardly opening recesses extending transversely to the direction of travel of the vehicle. A relatively flat elongated insert member formed of a plastic material is positioned on the bottom surface of the slug. The insert includes a pair of downwardly opening channels at opposite ends thereof, which channels are generally complementary to and received in respective ones of the slug recesses. The channels have opened end portions at opposite sides of the chassis and a wheel axis is loosely received in each of the channels with the ends of the axles extending through the openings and having a pair of wheels respectively secured thereto. A metal underplate is positioned on the bottom surface of the insert, substantially co-extensive therewith, with portions of the underplate covering the downwardly opened side of the channels to loosely retain the axles therein for rotation. Means are provided, integral with the slug, for securing the slug, insert and underplate together to form a unitary toy chassis assembly. The construction described is particularly suited for high speed assembly of sub-miniature toy vehicles.

3,711,990

CYLINDER MOUNTING FOR TOY DUMP TRUCK

Lee J. Pfeilsticker, Mound, Minn., assignor to Tonka Corporation, Mound, Minn.

Filed March 8, 1971, Ser. No. 121,942
Int. Cl. A63h
U.S. Cl. 46—214 **3 Claims**



A toy dump truck having a truck box hingedly mounted on a chassis for tilting movement between transport and dumping positions, a spring tensioned extension fluid jack having one end pivoted to the chassis and the other end pivoted to the box and biased toward an extended condition against a drainable fluid chamber to yieldably and slowly urge the box toward its dumping position, latch means for locking the box in transport position against spring tension of the jack, and one of said pivotal connections of the jack being slidable whereby when the latch means is released and the truck box is manually moved to a dumping position any stress on the jack will be minimized.

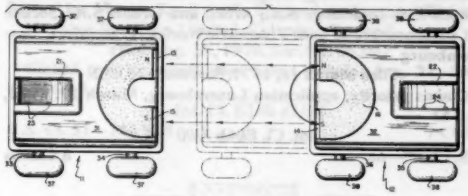
3,711,991

MAGNETIC EDUCATIONAL VEHICLE

John B. Orfei, N. Revere, and Henry Shapiro, Framingham, both of Mass., assignors to American Science & Engineering Inc., Cambridge, Mass.

Filed March 24, 1971, Ser. No. 127,743
Int. Cl. A63h *33/26*
U.S. Cl. 48—236 **6 Claims**

A magnetic educational vehicle is made of formed plastic and includes at one end a U-shaped recess for accommodating a U-shaped magnet with its legs oriented in the horizontal plane and at the other end an I-shaped recess for accommodating the same magnet with its legs aligned in the vertical plane. A pair of such vehicles help illustrate the principles of magnetic attraction and repulsion. By orienting the magnets with like poles opposed, pushing one vehicle causes the other to move away.

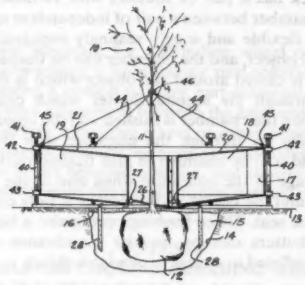


3,711,992

APPARATUS FOR NURTURING TREES

Marcel N. Martin, 1085 Richard Ave., Ottawa 8, Ontario, Canada

Filed March 18, 1971, Ser. No. 125,590
Int. Cl. A01g *29/00*
U.S. Cl. 47—48.5 **6 Claims**



Newly planted, transplanted and ailing trees require a continuous supply of water to the root area below ground level, access to air at ground level immediately above the root area, protection from the drying effects of excessive sunshine, stabilization of their trunks from the effects of high winds and maintenance of their trunks vertical. The apparatus described for this purpose includes a water tank shaped for placing on the ground substantially surrounding the lower trunk portion of the tree while defining a space around such portion. The tank is preferably formed of two like halves which, when joined together surrounding the lower trunk portion of the tree, define the space around it. The tank has an inner peripheral area located directly above the root area, an outer peripheral area located remote from the root area, and an intermediate area between the inner and outer peripheral areas. Surface means are located at the inner peripheral area for distributing at least a portion of the weight of the tank and water therein to the ground directly above the root area to exert a stabilizing effect thereon while not significantly penetrating the ground. Means are located around the outer peripheral area for supporting the same on the ground remote from the root area, including means for adjusting the level of the tank. The surface and supporting means locate at least a part of the intermediate area of the tank spaced above the ground to define air spaces over a substantial portion of the ground above the root area. Conduit means are provided for connecting the interior of the tank to the root area.

3,711,993
RELATIVELY SHORT AIR LOCK FOR TRANSFER OF RELATIVELY LONG OBJECTS

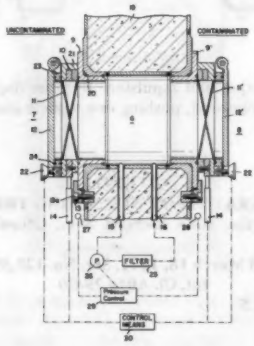
Jean Liesch, Esch/Alzette, and Jacques Removille, Steinfort, both of Luxembourg, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A., Arbed and Gradel S.A., Societe Luxembourgeoise pour l'Industrie Nucleaire, Steinfort, Luxembourg

Filed March 15, 1971, Ser. No. 124,172

Claims priority, application Luxembourg, March 17, 1970, 60.542

Int. Cl. E06b *7/00*

U.S. Cl. 49—68 **8 Claims**



An air lock has a pair of shutters with variable apertures defining a chamber between a pair of independent spaces. The shutters are flexible and snugly sealingly engageable around an elongated object, and the chamber can be flushed out. The first shutter is closed around the object which is then axially advanced through the second shutter which closes snugly around it. Then the chamber is flushed and the object is axially advanced fully on through the chamber with the shutters closed behind it. The chamber is also flushed during at least one other stage of the operation when one of the shutters is engaged around the object and the other is fully closed, for a unidirectional seal. Three flushings can make a bidirectional seal. The shutters can be annular membranes which are distorted or inflated to engage around the object.

3,711,994
POWER WINDOW IN MOTOR VEHICLE

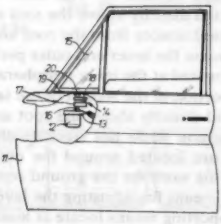
Gerhard Ulbrich, Buehl; Gert Kuhbauch, Buehlertal, and Ernst Fischer, Oberweier, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed April 16, 1971, Ser. No. 134,683

Claims priority, application Germany, April 20, 1970, P 20 18 807.2

Int. Cl. E05f *15/12*

U.S. Cl. 49—139 **7 Claims**



A window in a motor vehicle is mounted for pivotal movement about a pivot element. An electric motor drives a gear unit whose output shaft is coupled with the pivot in such a manner that pressure manually exerted upon the window disconnects the output shaft from the pivot so that the window can be manually moved in the event this is desirable or necessary because of malfunction of the motor or the gear unit.

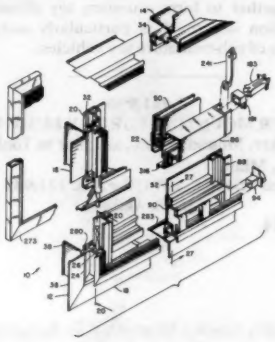
3,711,995
BUILDING STRUCTURE

Richard N. Anderson, Owensboro, Ky., assignor to V. E. Anderson Mfg. Co., Owensboro, Ky.

Filed June 22, 1970, Ser. No. 36,303

Int. Cl. E06b *1/04*

U.S. Cl. 49—504 **10 Claims**



Universal window structure which may be used as a single hung window, as a hopper window and as a right or left hand glider window without alteration is disclosed. Mulling means for securing a plurality of the window structures together, retaining clips for securing a screen thereto, false muntin structure, hurricane clips and piggyback storm window structure therefor and window trim structure for use therewith are specifically disclosed along with unique glazing strips, an insert for supporting sash balance structure, sealing strips and corner inserts, sash pivot structure, lock structure, sash guide and tilt release structure and hopper lock means for retaining the window sash in a plurality of separate tilted hopper positions. The frame of the window structure is constructed to permit rapid, accurate assembly with a minimum of low tolerance parts and to this end includes frame jamb adaptor extrusions. In addition, the total frame design allows many design variations whereby the universal window structure may be applied to and fit different building needs without additional job working or processing.

3,711,996
APPARATUS FOR MANUFACTURING V BELTS

William D. Braden, Stow, and Richard P. Marshall, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

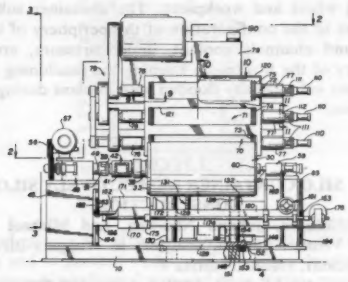
Filed Sept. 8, 1970, Ser. No. 70,138

Int. Cl. B24b *5/04, 19/02, 27/00*

U.S. Cl. 51—5 **15 Claims**

A cylindrical cured cord reinforced rubber sleeve is rigidly supported on rotatable, expandable mandrel, the mandrel is rotated about its longitudinal axis, a plurality of rotating grinding wheels are passed by the peripheral surface of the mandrel in a direction perpendicular to the longitudinal axis of the mandrel and engage the sleeve to cut peripheral grooves in the sleeve, and a plurality of rotating cutting blades pass the peripheral surface of the mandrel in a similar manner to sever the sleeve into a plurality of V-belts.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full



nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

3,711,997

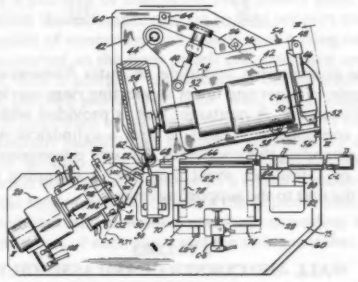
AUTOMATIC DRILL POINTING MACHINE WITH AUTOMATIC DRILL LOCATER SYSTEM

Anthony Kushigian, P.O. Box 512, 25804 Novi Road, Novi, Mich.

Continuation of Ser. No. 872,670, Oct. 30, 1969, abandoned. This application July 6, 1971, Ser. No. 159,921

Int. Cl. B24b *3/26*

U.S. Cl. 51—105 R **32 Claims**



An automatic drill pointin machine wherein unpointed drills are automatically fed to : loader from a hopper, loaded into the chuck of a work head, properly located and then ground. A particular locater assembly is provided to sense the angular position of a drill about its rotational axis as the drill is fed into the head. The locater includes a probe that tends to track in a flute of the drill so that at the end of the chucking operation the drill is at the correct angular position. However, if the probe does not properly orient the drill, the locater assembly initiates automatic indexing to bring the drill into proper orientation. The drill is carried eccentrically in the head. During successive rotation of the head, the drill rotates about its axis and revolves about the head axis to automatically present each drill face to a grinding wheel.

3,711,998

ADJUSTABLE SUPPORT STRUCTURES FOR MACHINE TOOLS

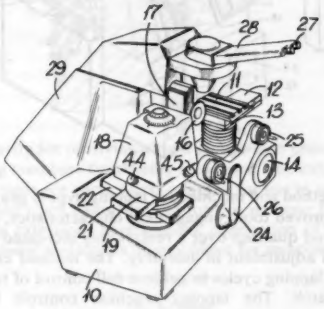
Peter Alan Mason, Kenilworth, England, assignor to Wickman Machine Tool Sales Limited, Coventry, England

Filed Aug. 21, 1970, Ser. No. 66,047

Claims priority, application Great Britain, Aug. 22, 1969, 41,906/69

Int. Cl. B24b *41/04*

U.S. Cl. 51—166 MH **7 Claims**



A support structure for a grinding wheel on a grinding machine, comprising a base having part-spherical seating, a housing having a complementary part-spherical portion permitting relative adjustment between the base and housing, the housing carrying a grinding wheel or other device, releasable locking elements whereby the housing can be locked relatively to the base in any selected position, and control elements for adjusting in two mutually perpendicular vertical planes.

3,711,999

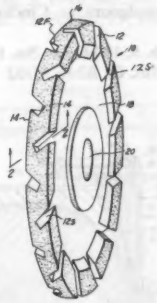
SELF-AIR COOLING ABRADING WHEEL

Gerhard R. Held, 22644 Shiell Drive, Mt. Clemens, Mich.

Continuation-in-part of Ser. No. 841,439, July 14, 1969, Pat. No. 3,579,928. This application Feb. 1, 1971, Ser. No. 111,272

Int. Cl. B24d *5/10*

U.S. Cl. 51—206 R **1 Claim**



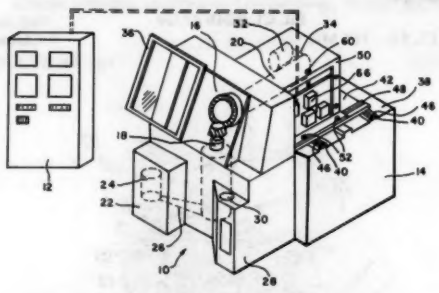
A monolithic abrading wheel having edge notches of such a size, shape and location as to function as air scoops, to scoop air from the atmosphere at the sides of the wheel into the notches and outlet such air at the face of the wheel for cooling at the wheel face.

3,712,000

METHOD FOR LAPPING GEARS

Gilmore M. Spear, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Dec. 16, 1970, Ser. No. 98,510
Int. Cl. B24b 1/00
U.S. Cl. 51—287 8 Claims



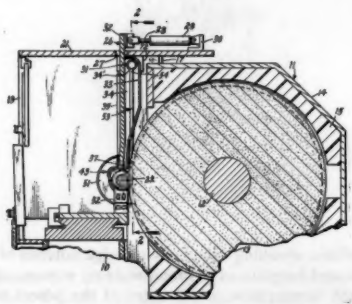
A new method and machine for lapping hypoid gear pairs to provide improved tooth engagement characteristics, resulting in good sound qualities over a remarkably increased range of pinion axial adjustment in assembly. The method employs a plurality of lapping cycles to achieve full control of tooth surface mismatch. The lapping machine controls backlash settings, set-overs, and all lapping motions with only three actuators, carries out the new method and achieves a versatility of lapping control far exceeding that available in prior art machines. A control panel provides an array of thumbwheel switches, graduated dials and selector switches for rapid entry of all lapping cycle control data, i.e., backlash, lapping motions and motion rates, number of passes, speeds and torques, all of these parameters being controlled independently for both forward and reverse sides of the teeth. The control panel also permits ready selection of alternative lapping methods including conventional one-cycle lapping methods as well as the novel multi-cycle methods disclosed herein. Stepping motors, responsive to data entered into the control panel, operate linear actuators to displace the gear spindle for effecting all lapping motions and relative gear-to-pinion displacements. The machine also is designed with a vertically oriented pinion spindle to reduce floor space and to facilitate adaptation to full automation.

3,712,001

COOLANT DISCHARGE SYSTEM FOR GRINDING MACHINE

Carl W. Kaesemeyer, Cincinnati, Ohio, and Dean H. Garman, Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Feb. 5, 1971, Ser. No. 112,949
Int. Cl. B24b 55/02
U.S. Cl. 51—356 6 Claims



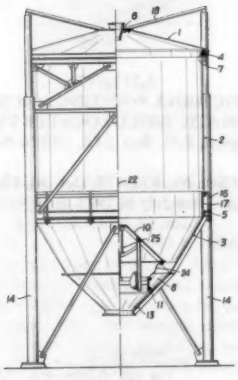
Coolant is directed into the machining zone during a grinding operation through a primary coolant discharge which substantially floods the entire machining zone with coolant, under pressure, and a secondary discharge which directs coolant specifically to critical heat points on the grinding wheel and workpiece. Coolant, under pressure, is contained in the machining zone by a container placed in front of both the grinding wheel and workpiece. The container substantially conforms to the configuration of the periphery of the workpiece, and channels coolant, under pressure, around the periphery of the workpiece keeping the machining zone and workpiece substantially flooded with coolant during grinding operations.

3,712,002

SILO CONTAINER RESPECTIVELY SILO CONSTRUCTION

Bruno Hillinger, Johann Nikowitz, and Michael Schwarz, all of Vienna, Austria, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria

Filed Feb. 25, 1971, Ser. No. 118,787
Claims priority, application Austria, March 12, 1970, 2336/70
Int. Cl. E04h 7/24; E04b 1/347
U.S. Cl. 52—63 11 Claims



A silo construction including an outer framework and at least a pair of upper and lower supporting rings carried by this outer framework. A container unit is provided with top and bottom components as well as with a cylindrical wall component extending therebetween. This unit is composed at least in part of a foldable sheet material. A clamping structure clamps the unit to the supporting rings.

3,712,003

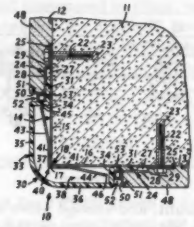
WALL AND CORNER GUARD ASSEMBLY

Edward C. Hallock, Summit; Robert W. Olsen, Chatham Borough, both of N.J.; George A. Viehmann, deceased, late of New Providence, N.J.; by Camille V. La Palme, Ridgefield, Conn., and by George A. Viehmann, Jr., Brighton, Mass. (coexecutors), assignors to Construction Specialties, Inc., Cranford, N.J.

Filed June 1, 1970, Ser. No. 42,023
Int. Cl. E04f 13/06, 19/02
U.S. Cl. 52—254 8 Claims

A wall protective assembly including a resilient protective strip with a central portion spaced from an underlying wall member to absorb and protect the wall from blows. The strip edges are received for limited movement in mounting recesses adjacent the wall. Movement of the edges out of the recesses is precluded by spring stops located under the central strip portion. A spacer conforming with the underlying wall member carries the spring stops and retainers which form the mounting recesses. The retainers are connected to, or formed integral

with, the spacer, to run parallel to the strip edges. For wall ends, the central strip portion is U-shaped, and resilient bumper members are supported under the central portion to



engage and restore the strip to its initial configuration upon impacting and to prevent wedging of the edges deeply within their recesses. Coordinated cap and base plates, conforming to the resilient strip, may close the assemblies at each end.

3,712,004

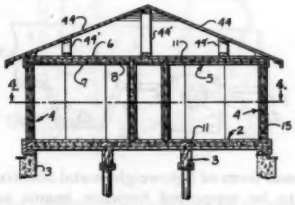
BUILDING CONSTRUCTION SYSTEM

Victor H. Loebsack, R.F.D. 7, Topeka, Kans.

Filed Oct. 12, 1970, Ser. No. 79,870

Int. Cl. E04b 2/08

U.S. Cl. 52—265 **7 Claims**



A building construction system provides a building wherein the entire building acts as a structural unit and the system comprises a plurality of connected floor panels each having edge portions thereof supported on spaced support members and a plurality of connected wall panels each having one edge thereof supported on the floor panels and extending upwardly therefrom with a plurality of connected ceiling panels supported on the wall panels. The floor, wall, and ceiling panels each are of laminated or sandwich construction and include a pair of generally parallel face members separated by an insulating core member. Adjacent edges of the floor, wall, and ceiling panels are secured together by a spline member placed between the face members of each of the adjacent panels to be secured together and fastening members extending through the face members of each panel and the spline member.

3,712,005

EXTRUSIONS FOR PARTITIONS, WALLS AND ENCLOSURES

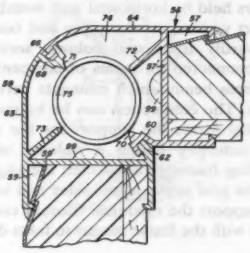
Robert C. Eschbach, Newport Beach, and John B. Colligan, Glendale, both of Calif., assignors to Aztec Manufacturing Company, Monrovia, Calif.

Filed Dec. 15, 1969, Ser. No. 884,812

Int. Cl. E06b 1/16, 1/52

U.S. Cl. 52—210 **19 Claims**

An extrusion for receiving and interconnecting laminated panel sections for quick construction of partitions or enclosures is disclosed. The extrusions form frame members for the partitions or enclosures and are designed to permit quick assembly and disassembly of building structures without the use of fasteners. The extrusions include channel portions adapted to receive the edges of the panels, the panels being grooved and adapted to snap into the corresponding channels. The extrusions may be H-shaped in cross section for forming panels into a flat partition or wall, may be formed with a channel on one side and adapted to receive door or window fittings on the other side, or may be formed in a corner unit configuration to permit joining of panels at right angles. The corner unit extrusion includes two interlocking half members which define a



central cavity for receiving a rigid pipe, which prevents the interlocking members from being separated. The extrusions and panel sections are particularly adapted for use in constructing light-weight truck canopies, and for this purpose J-shaped interlocking extrusions permit quick connection of side panels to a roof panel and form a pivotal hinge for an access door.

3,712,006

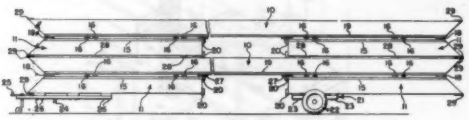
FOLDABLE BUILDING CONSTRUCTION OF ROOF AND WALL SECTIONS

Karl J. Bea, Route 1, Box 198, Syracuse, N.Y.

Filed April 5, 1971, Ser. No. 131,075

Int. Cl. E04b 7/12, 7/16

U.S. Cl. 52—71 **4 Claims**



A building construction in which integral wall and roof sections are ideally frabricated remotely from a building site and easily transported and erected at the building site.

3,712,007

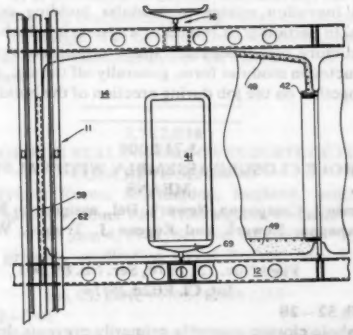
BUILDING SYSTEM AND COMPONENTS THEREFOR

Ernest Joseph Kump, 360 Everett Avenue, Palo Alto, Calif.

Filed Aug. 3, 1970, Ser. No. 60,520

Int. Cl. E04h 1/12, 9/06

U.S. Cl. 52—79 **16 Claims**



A building system employing standardized mass produced components cable of being assembled to form a large variety

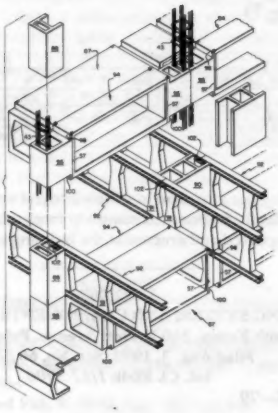
of different building structures, from simple individual dwellings to complex communities, by the selection of different combinations of standard components. The standard components include structural frame components, space modules and supports which support the space modules from the assembled frame components. The structural frame components comprise column sections having vertical clusters of support members held by horizontal web member which also serves to support vertical service pipes and conduits. Beams cantilever outwardly from said column sections and are adapted to be connected to beams of adjacent column sections, or to a cross beam which connects between adjacent column sections. The connection can be by means of a connector which also forms the support for the modules. The space each structurally define a volume of space with openings including frame means which are engaged by connecting collars to join adjacent modules and to engage with connectors to support the modules. Closure components are interchangeable with the frame means to form doors and windows.

3,712,008

MODULAR BUILDING CONSTRUCTION SYSTEM

Tancho D. Georgiev, 78 Hawthorne Avenue, Newton, Mass., and Robert M. Scanzani, 182 Bridge Street, Beverly, Mass.

Filed Oct. 16, 1970, Ser. No. 81,486
Int. Cl. E04b *1/348*
U.S. Cl. 52—79 **16 Claims**



This invention relates to modular building construction system. In particular, it relates to a system in which a supporting structure and a separate space utilization structure are constructed in modular form, generally off the site, and assembled together on the job during erection of the building.

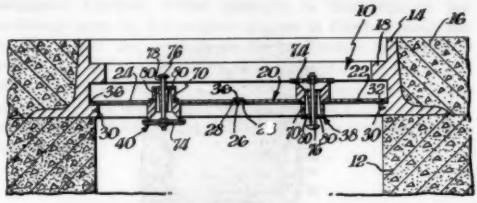
3,712,009

MANHOLE CLOSURE ASSEMBLY WITH VALVE RELIEF MEANS

Benjamin J. Campagna, Newark, Del., assignor to Benjamin J. Compagna, Newark and Eugene J. Truono, Wilmington, Del.

Filed Nov. 13, 1970, Ser. No. 89,301
Int. Cl. E02d *29/14*
U.S. Cl. 52—20 **4 Claims**

Manhole closure assembly primarily prevents drainage and storm water from emptying into manhole leading to sewerage system. Closure assembly comprises cover plate sealing off manhole opening. First valve is secured to cover plate for relieving pressure inside manhole when pressure therein exceeds



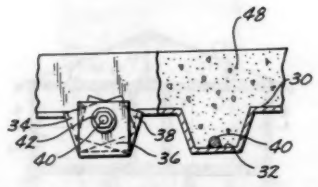
predetermined amount, and second valve member is secured to cover plate for relieving vacuum inside manhole when vacuum therein exceeds predetermined amount.

3,712,010

PRESTRESSED METAL AND CONCRETE COMPOSITE STRUCTURE

Max L. Porter, and Carl E. Ekberg, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa

Filed Aug. 17, 1970, Ser. No. 64,577
Int. Cl. E04c *3/10, 3/26*
U.S. Cl. 52—223 **3 Claims**



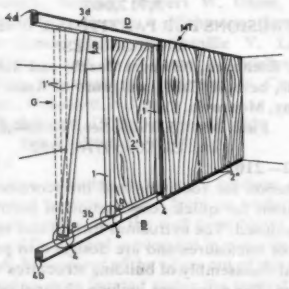
A prestressed form of lightweight metal construction which is adapted to be supported between beams and which is adapted to support a poured concrete floor or the like. The form is prestressed by means of tendons attached at the ends thereof and at various points along the length of the form. The prestressing of the forms provides a means of cambering the forms which offset the deflection due to the dead load imposed thereon. The prestressed form and the concrete supported thereby cooperate compositely to resist live loading.

3,712,011

PARTITION WALL CONSTRUCTION

Balthasar Husler, Olten, Switzerland, assignor to Alphons Glutz-Blatzheim AG, Solothurn, Switzerland

Filed Sept. 28, 1970, Ser. No. 76,092
Claims priority, application Germany, Oct. 9, 1969, A 9539
Int. Cl. E04b *2/74*
U.S. Cl. 52—241 **4 Claims**



To provide for ready removability and re-use of partition walls, and nail-less installation, a body of elastic material, such

as a neoprene material or the like is interposed between an upright and the floor and ceiling, or floor and ceiling stringers or plates, the upright being slightly longer than its clearance distance. The neoprene block is placed in the position which the upright is to occupy, the upright is placed aligned, in inclined position and hammered in place, to hold its place by frictional engagement and the resilient, compressive force of the elastic body. Thereafter, wallboard can be applied to the uprights which, typically are spruce or fir, such as two by fours or the like.

3,712,012

REINFORCED-CONCRETE PRESSURE VESSEL WITH LINING

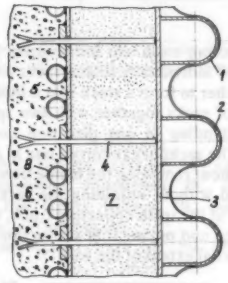
Joachim Meyer, and Josef Pfeffer, both of Essen, Germany, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Continuation-in-part of Ser. No. 34,081, May 4, 1970. This application Nov. 4, 1970, Ser. No. 86,838

Claims priority, application Germany, Nov. 5, 1969, P 19 55 570.5

Int. Cl. F28f *3/12*

U.S. Cl. 52—249 **9 Claims**



A reinforced-conrete vessel adapted to withstand pressure, e.g. for a pressurized-fluid nuclear reactor, has an inner lining of corrosion-resistant (stainless) steel having vertically or horizontally-running corrugations, the crests of which are supported by steel profiles.

3,712,013

DEVICE FOR FIXING PANELS AND ASSEMBLY

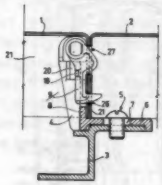
Serge Kalus, Saint Maurice, France, assignor to Cegedur GP., Paris, France

Filed Feb. 16, 1971, Ser. No. 115,369

Claims priority, application France, Feb. 17, 1970, 7005581

Int. Cl. E04c *1/10*

U.S. Cl. 52—584 **6 Claims**



A device for fastening rigid panels and an assembly embodying same wherein the fastening device is formed of a base and an upright portion and a hook member mounted for rotation on a shaft at one end and defining a hook at the other end and an intermediate release projection therebetween, and means for constantly urging the hook member away from the upright portion for engagement of the hook in openings in adjacent contiguous panels.

3,712,014

EMBEDDED ANCHORING SOCKET

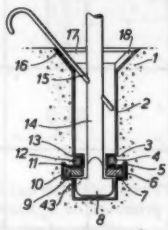
Thor Waerner, Graf. Reckestr. 160, Dusseldorf, Germany

Filed Nov. 27, 1970, Ser. No. 93,010

Claims priority, application Norway, Dec. 1, 1969, 4795/69

Int. Cl. E04h *1/38;* **E04c** *5/00*

U.S. Cl. 52—707 **13 Claims**



Anchoring means to be positioned in a concrete structure and comprising a socket adapted for reception of stud, is provided. The socket is embedded in the concrete structure and is provided with means for cooperation with the reinforcing irons in the concrete structure, whereby the force acting through the stud is transmitted to the reinforcing irons.

3,712,015

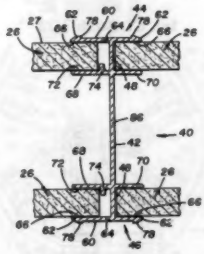
INTEGRAL STUD AND BRACKET STANDARD FOR USE IN A WALL CONSTRUCTION

Nels Nelson, Des Plaines, Ill., assignor to United States Gypsum Co., Chicago, Ill.

Filed Oct. 9, 1970, Ser. No. 79,580

Int. Cl. E04b *2/32*

U.S. Cl. 52—729 **12 Claims**



A stud and wall assembly constructed therewith for supporting shelf brackets and the like, the stud having as an integral part thereof, both a slotted flange for engaging shelf brackets, and as an extension of the flange, flat surfaces for engaging partition members which make up the wall. The slotted portion of the flange may be recessed within the stud or projected therefrom, so as to conceal or expose, respectively, the slotted portion. Additional bracket-supporting hooks can be extruded as part of the flange. The over-all cross-sectional configuration of most of the embodiments of the stud is an "H"-shaped configuration.

3,712,016

METHOD FOR SEALING GROOVES IN STRUCTURE CONCRETE SEALING

William Ernest Reeve, Huntingdon, England, assignor to Silent Channel Product Ltd., Huntingdon, England

Filed Jan. 4, 1971, Ser. No. 103,667

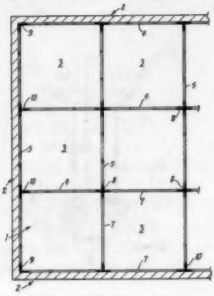
Claims priority, application Great Britain, Jan. 1, 1970, 118/70

Int. Cl. E01c *11/06;* **E04b** *1/68*

U.S. Cl. 52—741 **5 Claims**

The method involves the laying along each groove or space, a longitudinal sealing element having an inverted flexible

channel which bridges the groove or space and having lateral flange parts extending over adjacent portions of the concrete structure. A junction sealing element is disposed at each interconnection of the grooves or spaces, the junction sealing ele-



ments also having, like the longitudinal sealing elements, inverted flexible channels and lateral flanges, the channels of the junction sealing elements being in "L," "T" and "X" form for the sealing of the intersections of said grooves or spaces.

3,712,017

METHOD AND APPARATUS FOR THE APPLICATION OF CAPS TO BOTTLES OR THE LIKE

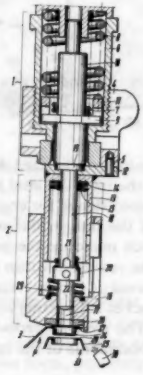
Uwe Knabe, 46 Dortmund-Hombruch; Arno Gust, 46 Dortmund-Solde, and Alois Hinxlage, 46 Dortmund, all of Germany, assignors to Holstein & Kappert, Maschinenfabrik Phonix GmbH, Dortmund, Germany

Filed July 20, 1970, Ser. No. 56,416

Claims priority, application Germany, July 19, 1969, P 19 36 795.4

Int. Cl. B65b 7/28

U.S. Cl. 53—43 **13 Claims**



Plastic caps of the type having a cupped central portion, an annular marginal portion and a lifting tab extending downwardly and outwardly from the marginal portion are applied to the open tops of bottles which travel along a circular path by means of attachments which can be secured to the capping units of a conventional bottle capping machine. Each attachment has a two-piece ram which is moved downwardly by the respective capping unit while the latter tracks a fixed cam whereby the ring-shaped outer part of each ram depresses the marginal portion of a cap during a first stage of each revolution of the associated capping unit so that the marginal portion remains spaced from the open top of the bottle and that the space between the marginal portion and the top can be cleaned to expel liquid particles and/or foam. In the next stage of each revolution, the outer part of the ram moves the marginal portion into abutment with the open top and the plunger-like inner part of the ram simultaneously engages and forces the central portion of the cap into the open top of the aligned bottle.

3,712,018

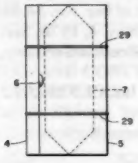
METHOD OF FOLDING AND BUNDLING LARGE SACKS

Erik L. Lundin, Vallingby, Sweden, assignor to Sven Hansson & Co. AB., Bromma, Sweden

Continuation-in-part of Ser. No. 782,108, Dec. 9, 1968, abandoned. This application Jan. 18, 1971, Ser. No. 107,356

Int. Cl. B65b 11/00, 13/02

U.S. Cl. 53—21 **5 Claims**



Sacks for collecting trash are individually folded at least twice and stacks of individually folded sacks are accumulated one on top of another to form a stack that is bundled by grouping the plurality of sacks together with two spaced bands of wire or cords extending in one direction circumferentially about the stack. The sacks are removed one at a time from the bundled stack without removing the bands from the remaining bundled stack and without unfolding the sacks remaining in the bundled stack at the trash collecting truck, by grasping the sack to be removed and pulling it in a direction perpendicular to the circumferential extent of the wire.

3,712,019

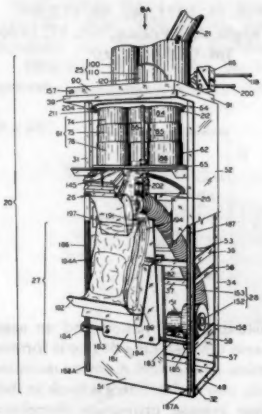
APPARATUS AND PROCESS FOR DISPENSING ICY MATERIAL

Charles E. Lamka, 1218 Crockett St., and Walter J. Atkins, 2414 South Ong, both of Amarillo, Tex.

Continuation-in-part of Ser. No. 751,241, Aug. 8, 1968, Pat. No. 3,543,811. This application Aug. 17, 1970, Ser. No. 64,231

Int. Cl. B65b 43/36, 57/14

U.S. Cl. 53—29 **8 Claims**



Apparatus and process for accurate continuous automatic volumetric dispensing and bagging of large amounts of ice arcs

and cubes and like icy particulate material normally tending to form larger clumps of varying size and stiffness. Repeated small volumes of such to be bagged icy material are intermittently automatically continually and approximately measured out and brought to and briefly maintained in a fluid condition immediately prior to continuous dispensing thereof to smaller final volumetric measuring dispensing and bagging apparatus designed to avoid packing of such icy particulate material.

3,712,020

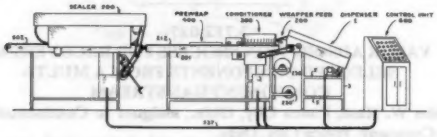
SYSTEM AND METHOD OF WRAPPING

David A. Norr, Fort Wayne, and Robert C. Norr, Grabill, both of Ind., assignors to Norr Engineering-Manufacturing Corp., Fort Wayne, Ind.

Filed Feb. 6, 1969, Ser. No. 797,134

Int. Cl. B65b *11/52*

U.S. Cl. 53—30 **39 Claims**



The invention is directed to a system whereby a product is sealed in a fusible plastic wrapper by shriveling and fusing portions of the latter.

3,712,021

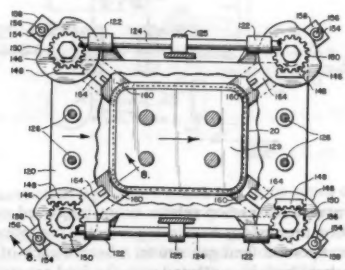
CONTAINER CLOSURE APPARATUS

George H. Logemann, Mundelein, Ill., and Gerhardt, G. Voelz, Jr., Elk Grove Village, Ill., assignors to EKCO Products, Inc., Wheeling, Ill.

Filed April 1, 1971, Ser. No. 130,389

Int. Cl. B65b *7/28*

U.S. Cl. 53—329 **12 Claims**



An apparatus for securing covers over the upper rim of an open top container wherein the rim of each container is defined by an outwardly projecting bead and each cover is provided with a marginal flange includes cornering dies movable toward and away from the corners of the container along fixed lines of travel diagonally of the corners of the container effective to tuck the cover flange into underlying engagement with the bead of the container.

3,712,022

SHOCK WAVE APPLICATION OF TWIST-OFF CROWNS

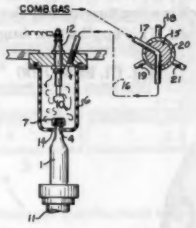
Paul M. Erlandson, Palos Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 2, 1970, Ser. No. 86,000

Int. Cl. B65b *7/28*

U.S. Cl. 53—42 **12 Claims**

This apparatus applies twist-off crowns to the tops of bottles by forming the crowns in place. A cap blank is placed over the threaded top of a bottle. A combustible gas is placed in a confined space above the cap blank. The combustible gas is ignited and the cap blank forms onto the bottle top making a



functional twist-off cap from the crown blank. When the combustible gas is ignited, a compressive wave strikes the cap blank and forms it to the twist-off top.

3,712,023

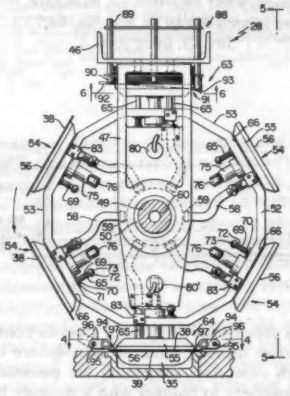
METHOD AND APPARATUS FOR TRANSFER RING ARTICLES

George D. Bryan, Jr., Mechanicsville, and Nicholas Constantino, Richmond, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed March 25, 1971, Ser. No. 128,348

Int. Cl. B65b *57/02, 7/28*

U.S. Cl. 53—307 **4 Claims**



In a container closing method and apparatus, a cover member transferring device for transferring a cover member from a first location where a supply of cover members is provided to a second location where a product filled container body is to receive the transferred cover member for closing the same. A carrier is supported by a support frame and is movable relative thereto in a fixed path from adjacent the first location to adjacent the second location. A pick-up device is suitably carried by the carrier and is movable relative thereto, the carrier having means for extending the pick-up device therefrom adjacent the first location to pick up a cover member and thereafter return the pick-up device with a cover member thereon. The carrier is moved in the fixed path so that the pick-up device is moved adjacent the second location where the pick-up device is again extended adjacent the second location for depositing the cover member on a filled container body whereby the pick-up device can thereafter be retracted to be moved back to the first location for receiving another cover member in the same manner.

3,712,024

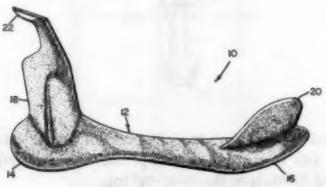
INTEGRAL SADDLE TREE AND GROUND SEAT

Erby Roy Nankivell, Athens, Tenn., assignor to Ralide, Inc., Athens, Tenn.

Continuation-in-part of Ser. No. 730,874, May 21, 1968, abandoned, which is a continuation of Ser. No. 822,907, May 8, 1969, abandoned. This application Aug. 16, 1971, Ser. No. 172,208

Int. Cl. B68c *1/00*

U.S. Cl. 54—44 5 Claims



A one-piece saddle tree assemblage is provided by integrally forming a seat, front and rear jockeys, a cantle, pommel and a ground seat by injection molding the tree assemblage in a single common mold cavity within which a metallic saddle horn is positioned for attachment to the molded tree assemblage as it is molded.

3,712,025

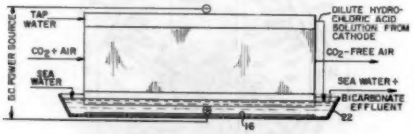
CONTINUOUS ELECTROMIGRATION PROCESS FOR REMOVAL OF GASEOUS CONTAMINANTS FROM THE ATMOSPHERE AND APPARATUS

Richard A. Wallace, 9707 Fourth Ave., Brooklyn, N.Y.

Filed March 30, 1970, Ser. No. 23,733

Int. Cl. B03c *9/02*

U.S. Cl. 55—2 19 Claims



A continuous process for removal of gaseous contaminants, particularly carbon dioxide, from an atmosphere containing the same, which comprises subjecting the gaseous contaminant laden atmosphere to contact with a strongly basic ionic polymer sheet under the influence of an applied electrical field. The apparatus for accomplishing this comprises at least one and preferably a plurality of sheets of strongly basic ionic polymeric material partially suspended at the lower end thereof into a circulating stream of sea water, the polymeric sheets being interspersed between a source of an appliable electric field, e.g. a cathode and an anode, and a cation-exchange membrane and an anion-exchange membrane being in turn interspersed between the cathode and the upper exposed ends of the polymeric sheets.

3,712,026

ENTHALPY EXCHANGE SYSTEM

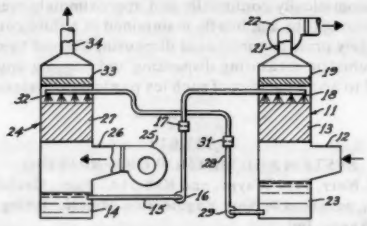
William C. Griffiths, 70 John F. Kennedy Blvd., Somerset, and Emery A. Danko, 30 Clearview Drive, East Brunswick, both of N.J.

Filed Nov. 4, 1970, Ser. No. 86,788

Int. Cl. B01d *53/14*; F24d *15/00*

U.S. Cl. 55—32 13 Claims

An enthalpy exchange system utilizing a hygroscopic solution to transfer latent and sensible heat between an incoming fresh air stream and an air stream being exhausted to effect partial conditioning of air and/or an overall economy of operation in a universal air conditioning system.



3,712,027

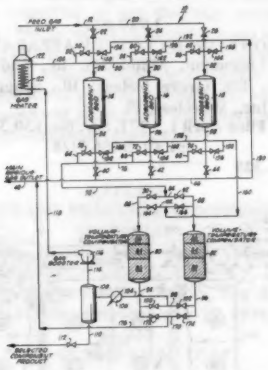
VAPOR ADSORPTION PROCESS FOR RECOVERING SELECTED COMPONENTS FROM A MULTI-COMPONENT GAS STREAM

John W. Hasz, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 22, 1971, Ser. No. 109,720

Int. Cl. B01d *53/04*

U.S. Cl. 55—33 16 Claims



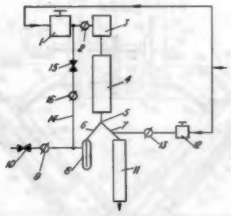
The present invention relates to an improved cyclic vapor adsorption process for recovering selected components from a multi-component feed gas stream wherein each of a plurality of adsorbent beds is contacted with the feed gas stream so that adsorbable components contained therein are adsorbed, then contacted with a regeneration gas stream so that adsorbed components are desorbed therefrom, and then contacted with a cooling gas stream so that the bed is cooled preparatory to again being contacted with the feed gas stream. The process includes a pair of compensator zones to provide temperature and volumetric compensation in the regeneration and cooling gas circuits, which zones are alternately connected into the cooling and regeneration gas circuits downstream of the adsorbent beds. Each of the compensator zones contains adsorbent material which has an affinity for unselected adsorbable components contained in the feed gas stream. As the regeneration gas stream is passed through one of the compensator zones unselected adsorbable components are adsorbed therefrom and a product stream comprised of selected components is produced. As the cooling gas stream passes through the other of said compensator zones the unselected adsorbable components described during the previous cycle are desorbed therefrom.

3,712,028

GAS FLOW SWITCHING METHOD AND APPARATUS

David Robert Deans, Norton-on-Tees, County Durham, England, assignor to Imperial Chemical Industries, Ltd., London, England

Continuation of Ser. No. 779,780, Nov. 29, 1968, abandoned.
This application Jan. 14, 1971, Ser. No. 106,571
Claims priority, application Great Britain, Dec. 1, 1967, 54,866/67
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 9 Claims



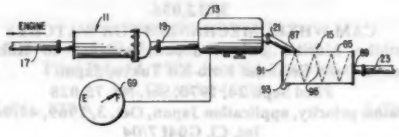
A gas flow switch for gas chromatography operates by passing a gas stream through a multi-outlet junction and blocking all but a selected one of the outlet limbs to the stream, at least one outlet limb being bloackable by feeding gas at a controlled pressure to it.

3,712,029

EXHAUST POLLUTION CONTROL SYSTEM

Jaehn B. Charlton, Reedville, Va.

Filed June 25, 1970, Ser. No. 49,832
Int. Cl. B01d *50/00*
U.S. Cl. 55—100 14 Claims



An exhaust cleaning system which has three types of cleaning elements: a dry-scrubber cleaning element; a wet-scrubber cleaning element; and a filter cleaning element is disclosed. Cleaning members in each of the cleaning elements can be individually removed and replaced. The dry-scrubber cleaning element comprises insert tube cleaning members which can be removed from an outer housing for replacement. The dry-scrubber cleaning element further includes electrodes and magnets to attract magnetic pollutants. The wet-scrubber cleaning element comprises a tank, a liquid agent held in a sponge, and a copper surface plate. The filter cleaning element comprises a removable filter element mounted in a housing.

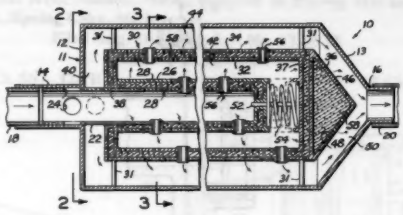
3,712,030

EXHAUST DEPURATOR

John D. Priest, 608 Briarcrest Crest, Midwest City, Okla.

Filed Sept. 14, 1970, Ser. No. 72,058
Int. Cl. B01d *39/02*
U.S. Cl. 55—213 2 Claims

An exhaust depurator comprising a muffler-like shell interposed in a combustion engine exhaust pipe. The shell contains coaxial foraminated double walled tubular members having the space between the double walls filled with an exhaust gas filtering material for purifying the major portion of the exhaust gases from an internal combustion engine. Bypass means prevent exhaust gas back pressure against the engine exhaust valves.

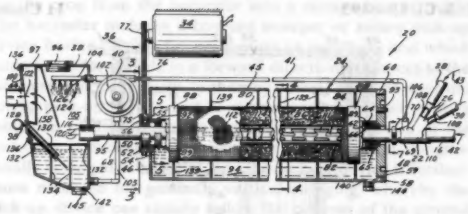


3,712,031

ANTI-SMOG AND EXHAUST DEVICE

Leon M. Santa Cruz, 1649 Heather Hill Rd., Pico Rivera, Calif.

Filed March 19, 1971, Ser. No. 126,245
Int. Cl. B01d *47/16*
U.S. Cl. 55—223 8 Claims



This invention discloses an anti-smog and exhaust device positioned rearwardly of a typical muffler, as used in an internal-combustion engine exhaust system. The specific device comprises a rotatable drum adapted to receive a filter unit therein for rotation with the drum about a tubular pipe that is fixedly connected to the exhaust system at one end thereof, and connected at its opposite end to a reservoir which supplies a liquid chemical by means of a pumping system to the rotating drum by way of the tubular pipe. The liquid intermingles with the exhaust fumes as they pass from the muffler to the interior of the drum and thereby transports the foreign particles and elements of the fumes into the filter unit, allowing the cleaned exhaust gases to enter the reservoir area where they once again are sprayed by a mist of the liquid before being expelled to the atmosphere as non-contaminated fumes.

ERRATUM

For Class 55—228 see:
Patent No. 3,712,041

3,712,032

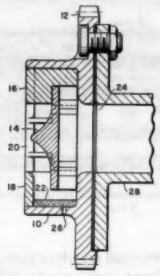
HIGH SPEED CENTRIFUGAL AIR-OIL SEPARATOR

Alvaro Obligado, Portchester, N.Y., assignor to Anco Corp., Stratford, Conn.

Filed Nov. 19, 1970, Ser. No. 91,118
Int. Cl. B01d *45/12*
U.S. Cl. 55—409 6 Claims

An air-oil separator is constructed as an integral part of a gear box and it includes a rotating cylindrical housing in which are mounted an axially positioned radial deflector and a plurality of radial vanes for centrifuging the oil-air mixture. The

heavier oil displaces the lighter air creating a pool of oil on the inner surface of the cylinder. The pool of oil is permitted to



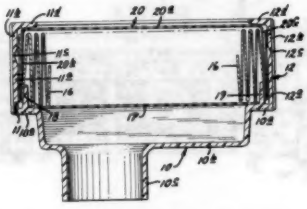
flow through radially disposed holes in the housing but is maintained at a sufficient depth to provide a seal against the escape of air which is vented axially overboard.

3,712,033

AIR CLEANER WITH HINGED SIDE WALLS

Donald D. Gronholz, Minneapolis, Minn., assignor to Donaldson Co. Inc., Minneapolis, Minn.

Filed June 1, 1971, Ser. No. 148,489
Int. Cl. B01d *46/52*
U.S. Cl. 55—493 **11 Claims**



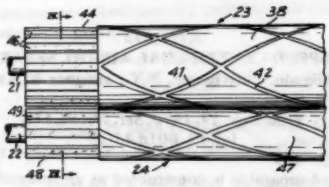
A box-like filter housing molded from a plastic material is shown, having a rectangularly shaped pleated filter element and protective screen mounted therein. The housing includes a bottom wall with an aperture, and a pair of opposing side walls each having a hinged upper portion with a lip formed thereon to swing over the adjacent edge of the filter and screen to hold them in the housing. End walls are provided to seal the ends of the filter element and to hold the side walls in position. In one form of the invention, the end walls are hinged to the bottom wall.

3,712,034

CRUSHING ROLLS FOR HAY CONDITIONER

Casimir Praca, Wasquehal, France, assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 646,852, June 19, 1967, abandoned.
This application June 8, 1970, Ser. No. 48,819
Int. Cl. A01d *49/00*
U.S. Cl. 56—1 **4 Claims**



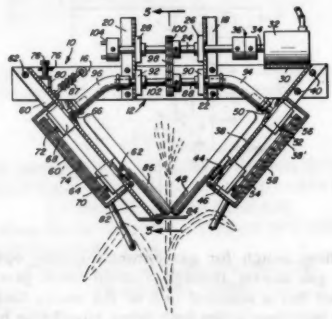
A hay conditioner with rollers having intermediate portions of elastomer material and ribbed steel or plastic end portions, the diameters of which are less than and at most equal to the diameter of the intermediate portion of the respective roll and the axial lengths of which are at least equal to the width of the windrow boards.

3,712,035

MACHINE FOR DETASSELING CORN

Benjamin T. Gildersleeve, R.F.D. No. 1, Hudson, Ill.

Filed March 25, 1971, Ser. No. 128,051
Int. Cl. A01d *45/02*
U.S. Cl. 56—63 **12 Claims**



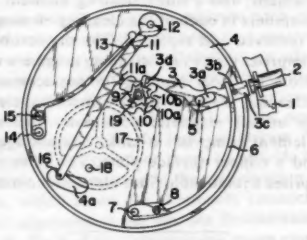
A support for movement horizontally along the upper ends of cornstalks and including a pair of side-by-side driven friction wheels with adjacent peripheral portions rollingly engaged with each other for frictionally engaging and positively driving the upper portions of cornstalks therebetween. The frame includes a generally horizontal stationary cutting blade adjacent and spaced vertically relative to the adjacent peripheral portions of the friction wheels for cutting and thus removing the top and tasseled portions of cornstalks passing between the friction wheels.

3,712,036

CAM WHEEL MECHANISM FOR WATCHES

Katsuhiko Morita, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha Koto-Ku Tokyo, Japan

Filed Sept. 24, 1970, Ser. No. 75,028
Claims priority, application Japan, Oct. 3, 1969, 44/94116
Int. Cl. G04f *7/04*
U.S. Cl. 58—76 **5 Claims**



An cam wheel mechanism adapted for application to stopwatch or chronograph arrangements in watches is provided having a ratchet wheel superposed on and tightly fixed to a cam wheel for rotation about a common axis. An operating lever is positioned for engagement with a tooth of the ratchet wheel for the incremental rotation of said ratchet wheel and cam wheel. The cam wheel is formed with alternating projections and recesses in the periphery thereof dimensioned for

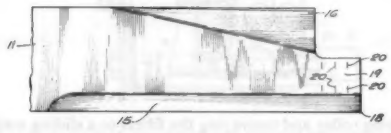
engagement or receipt of a corresponding projection on a start and stop lever biased against said cam wheel. The projection on the start and stop lever, and the projections and recesses on said cam wheel cooperating to position the start and stop lever and the cam wheel between operative displacements of said operating lever without the use of a cam wheel spring.

3,712,037

LENGTH-ADAPTABLE ROTARY MOWER BLADE

Earl A. Knipe, Warsaw, Ill., assignor to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Dec. 6, 1971, Ser. No. 204,993
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **1 Claim**



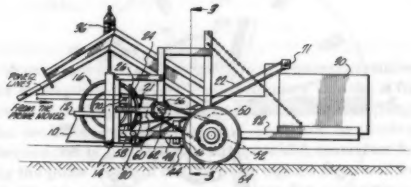
The ends of a rotary mower blade are modified so that they may be readily ground to a shorter length and thus readily adjusted to fit in the circular mower housing with the proper clearance of generally not more than about one-half inch or less where required between each tip of a blade and the housing or between the tips of adjacent blades. The blade is provided with marking which facilitates grinding each end without unnecessary measurements.

3,712,038

ASPARAGUS HARVESTER

George R. Barker, P. O. Box 518, Banning, Calif.

Filed Feb. 14, 1972, Ser. No. 225,999
Int. Cl. A01d *45/00*
U.S. Cl. 56—327 A **5 Claims**



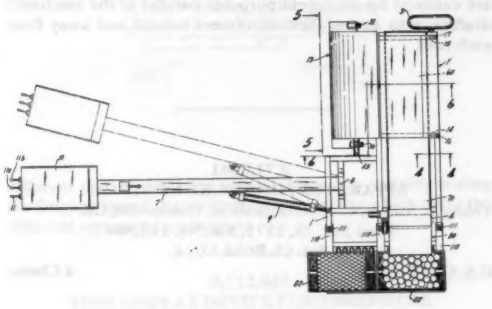
An asparagus harvester which engages the growing asparagus in the field, cuts the asparagus spears at or below the ground level, releases the asparagus spear onto a conveyor belt which conveys the asparagus spear on an inclined belt moving upwardly and rearward from the asparagus harvesting device, in a direction opposite to the travel of the harvesting device. After reception of the asparagus spears by the inclined belt, they are deposited in a hopper or box carried on the rear of the machine. A roller is provided rearwardly from the pick-up mechanism and saw, and through a parallelogram of the frame members maintains a constant depth of the saw at or below the ground level.

3,712,039

CROP PICK-UP HARVESTER

John M. Avis, Nunice, Mich., assignor to Harvey Harvester, Inc., Spring Lake, Mich.

Filed Aug. 18, 1971, Ser. No. 172,623
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 R **15 Claims**



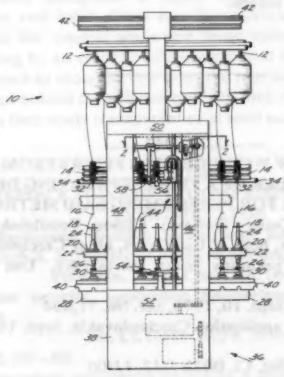
A mobile harvester for picking up fruit such as apples, oranges, nuts or vegetables for example, lying on the ground, passing the crop through a trash separator and then discharging the crop from the harvester into a storage box or truck. The harvester includes a covered sweeper or rotary pick-up device having flexible fingers around its periphery and which rotates at its underside in a forward direction in respect to the movement of the vehicle, to thereby convey the crop over the rotary pick-up device and to a transverse conveyor with a minimum of damage to the fruit. The pick-up device of the harvester is mounted for pivoting about a central, longitudinally arranged pivot point, and the pick-up device is furthermore mounted for generally vertical swinging, whereby the pick-up device can closely follow the contour of the ground over which the harvester travels. The harvester also includes a trash separator which separates trash from the crop and which additionally acts to clean the crop before discharging it into the storage bins.

3,712,040

YARN JOINING ASSEMBLY FOR AUTOMATIC YARN PIECING APPARATUS

Albert D. Harmon, Clemson, S.C., assignor to Maremont Corporation, Chicago, Ill.

Filed March 5, 1971, Ser. No. 121,351
Int. Cl. D01h *15/00*
U.S. Cl. 57—34 R **20 Claims**



An improved assembly of the type used in an automatic yarn piecing apparatus for joining yarn issuing from a textile

machine's drafting rolls and yarn extending from a bobbin of the machine. The assembly includes a yarn joining roller biased forwardly by a leaf spring element, and means for clamping, cutting and controlling the tension in the yarn, the aforesaid components being so interconnected and arranged as to provide a simplified and readily adjustable assembly affording consistently reliable operation. In an alternative embodiment the assembly and a supporting pivot arm therefor are cammed for alignment purposes parallel to the machine's drafting rolls during their movement toward and away from such rolls.

3,712,041

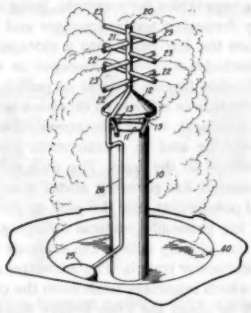
APPARATUS FOR SMOKE CONTROL

Young T. Sailers, C-15 Atlanta Road, Gainesville, Ga.

Filed Jan. 29, 1971, Ser. No. 110,804

Int. Cl. B01d *53/14*

U.S. Cl. 55—228 **4 Claims**



An apparatus for use in controlling smoke expelled from an exhaust stack to prevent pollution of the atmosphere by the smoke being exhausted therefrom. Fog generating means is supported on the stack above the exhaust opening for generating a moisture laden fog around the opening whereby moisture will saturate the smoke exhausted therefrom to cause the smoke to fall by gravity from the atmosphere. The fog generating means includes means for collecting and filtering the moisture saturated smoke and reusing the filtered moisture in the fog generating means.

3,712,042

METHOD OF WITHDRAWING FIBERS FROM A COMBING ROLLER OF A FIBER SEPARATING DEVICE AND DEVICE FOR PERFORMING SAID METHOD

Milan Chrtek, Ceska Trebova; Ctibor Doudlebsky, and Stanislav Kabele, both of Usti Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti n/Orl, Czechoslovakia

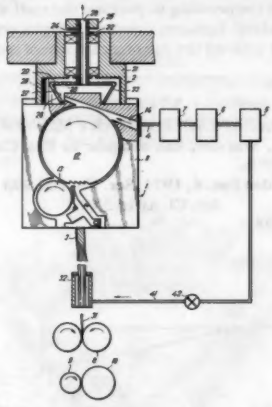
Filed Sept. 10, 1970, Ser. No. 71,004

Claims priority, application Czechoslovakia, Sept. 16, 1969, 6261/69

Int. Cl. D01h *1/12, 1/00*

U.S. Cl. 57—58.95 **6 Claims**

In a spinning unit comprising a fiber separating device and a spinning device, fibers are separated by withdrawing the fibers from a combing roller of the fiber separating device by a pressure air stream, directed tangentially to the working surface of



the combing roller and conveying the fibers to a sliding wall of the rotary spinning chamber.

ERRATUM

For Class 58—76 see:
Patent No. 3,712,036

3,712,043

DAY-DATE TIMEPIECE WITH MULTIPLE DISPLAY OF DATES AND DAYS OF WEEK

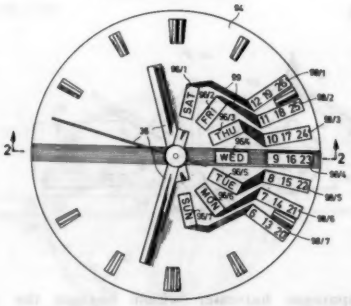
Joseph Egger, Pforzheim; Heinz Meitinger, Mutlangen, and Herbert Schwartz, Wurmberg, all of Germany, assignors to Timex Corp., Waterbury, Conn.

Filed Jan. 3, 1972, Ser. No. 214,911

Claims priority, application Germany, Nov. 3, 1971, P 21 54 551.7

Int. Cl. G04b *19/24*

U.S. Cl. 58—5 **7 Claims**



This invention relates to a timepiece, such as a wrist watch, with a drive for the step-by-step rotation of at least one numeral disc comprising a date ring and concentrically mounted day ring, having the days of the week in annular arrangement, both rings being covered by a dial. The dial includes at least one main date window and one main day window which may be combined to form one common main window and each making visible one day of the week on the day ring and the contemporary date on the circle of numerals. Additional windows may be provided to show prior and succeeding dates.

3,712,044

ELECTRIC CLOCK MOUNTING AND CONTACT APPARATUS

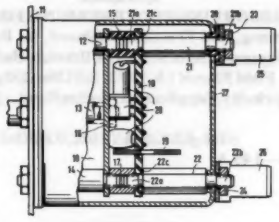
Robert Wolber, 7233 Lauterbach, and Friedrich Assmus, 723 Schramberg, both of Germany, assignors to Firma Gebruder Inghams GmbH, Schramberg, Germany

Filed Nov. 1, 1971, Ser. No. 194,726

Claims priority, application Germany, Nov. 6, 1970, P 20 54 757.3

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 R 4 Claims



An electric clock mounting and contact apparatus including an electric clock housing, an electric drive circuit positioned within the housing, pillar means extending between the housing and the electric drive circuit for supporting said electric drive circuit, the pillar means being electrically conductive and in electrical contact with the electric drive circuit, an electrical contact means connected exteriorly of the electrical clock housing and to the pillar means, said electrical contact means being operable for electrical contact with a voltage source exterior of the electric clock housing.

3,712,045

QUARTZ CRYSTAL WATCH

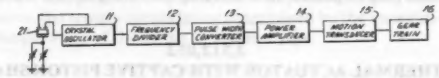
Kazuo Ito, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Dec. 14, 1970, Ser. No. 97,983

Claims priority, application Japan, Jan. 28, 1970, 45/7011

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 A 6 Claims



A quartz crystal watch comprising a quartz crystal oscillator for generating relatively high frequency signals, a frequency divider circuit for reducing and converting the frequency of the oscillated signals from said oscillator to predetermined frequencies of clock pulse, a pulse width converter for reducing the pulse width of output pulse signals from said frequency divider circuit, a motion transducer for converting the amplified output signals from the amplifier pulse width converter to the corresponding mechanical motions, and a gear train mechanism driven by said mechanical motions, the gear action of said gear train being made to follow the accurate time.

3,712,046

ROTATING RING DISPLAY

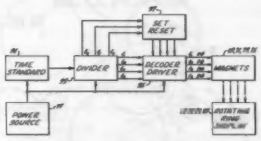
Hans G. Dill, 2870 Tabago Place, Costa Mesa, Calif.

Filed May 24, 1971, Ser. No. 146,199

Int. Cl. G04b *19/20, 45/04;* G04c *3/00*

U.S. Cl. 58—45 15 Claims

An electronic wristwatch in which time is displayed by means of a plurality of separately sealed, independently rotatable, coplanar concentric rings. Each ring carries a plurality of magnetic domains and is independently stepped by a set of electromagnets driven by a multiphase pulse train. Typically, each ring is stepped at a different rate so as to display a different unit of time, this being achieved by suitably scaling the frequencies of the multiphase pulse trains which drive the different sets of electromagnets.



3,712,047

TIME DISPLAY DEVICE FOR TIMEPIECES

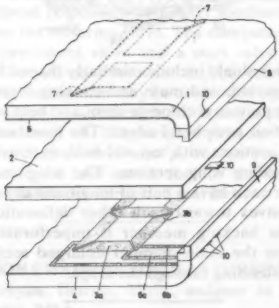
Pierre Girard, Bienne, Switzerland, assignor to Manufacture des Montkes Rolex S. A. Bienne, Bienne (Canton of Berne,) Switzerland

Filed May 11, 1971, Ser. No. 142,141

Claims priority, application Switzerland, May 11, 1970, 6974/70

Int. Cl. G04b *19/30, 19/02*

U.S. Cl. 58—50 R 3 Claims



The time display is ensured by the electrooptic effect of a cell which comprises a liquid crystal layer sandwiched between two solid plates carrying electrodes. The contrast between the neutral areas and those submitted to dynamic scattering by an electric field is enhanced by light rays which are caused to cross the cell from the rear to the front. A lamp arranged behind the cell can produce such rays. The rear electrode is then made transparent or at least semitransparent.

3,712,048

TIMEPIECE MOVEMENT COMPRISING A JUMPING TYPE INDICATOR

Peter Bachmann, Bettlach, Switzerland, assignor to Ebauches Bettlach S. A., Bettlach Canton of Soleure, Switzerland

Filed Jan. 7, 1971, Ser. No. 104,678

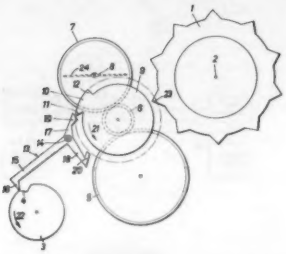
Claims priority, application Switzerland, Jan. 12, 1970, 348/70

Int. Cl. G04b *19/24, 33/00*

U.S. Cl. 58—58 6 Claims

A timepiece movement including a star gear for driving a jumping indicator of the type used on digital indicator timepieces. The star gear is driven by a cam which moves the star gear one step for each cam rotation. The cam is continu-

ously biased to rotate by an auxiliary spring, and a lever under the control of the main timepiece releases the cam for a single



rotation at time intervals commensurate with the digital display to be made by the member connected to the star gear.

3,712,049

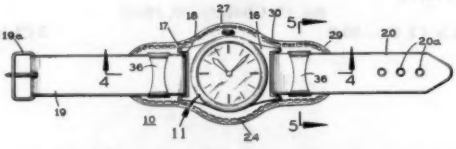
WRIST WATCH SHIELD

Henry Luxembourg, 267 S.W. 15th Street, Dania, Fla.

Filed Sept. 20, 1971, Ser. No. 181,800

Int. Cl. G04b *43/00*

U.S. Cl. 58—105 **6 Claims**



A wrist watch shield includes similarly shaped longitudinally extending superimposed main and backing members formed of soft pliable polyvinyl chloride sheet and heat sealed to each other along their peripheral edges. The members have medially enlarged sections with top and bottom convex edges and laterally extending wing sections. The wing sections of the main member each have a pair of longitudinally spaced transverse slits convex toward each other delineating respective loops and the backing member is imperforate. In use the watch rests on the main member enlarged section with the watch band extending through the loops.

3,712,050

DIGITAL INDICATING MACHINE

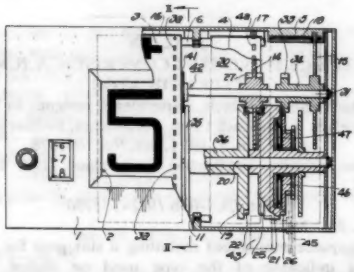
Toshio Kawada, 6-4,Miyashita-cho, Sakaide, Japan

Filed May 20, 1971, Ser. No. 145,236

Claims priority, application Japan, June 2, 1970, 45/48179

Int. Cl. G04b *19/02*

U.S. Cl. 58—125 C **6 Claims**



A digital indicating machine such as a digital clock comprises a number of endless indicating belts carrying letters, numerals or the like thereon and provided with a number of perforations along one of the lengthwise edges thereof, sprocket wheels are engaged with the perforations of said belts for travelling the belts to pass behind indicating windows, and driving wheels which drive pinions combined with or connected to the sprocket wheels intermittently. Because of the endless indicating belts and the intermittent driving mechanism for the belts, relatively large letters, numerals or the like for representing time etc. can be indicated at the indicating windows.

3,712,051

SHOCK ABSORBING PIVOT BEARING FOR WATCHES

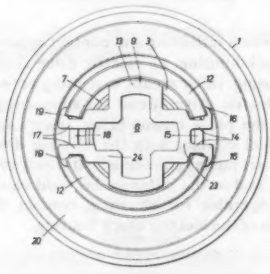
Lucien Romang, and Francois Voumard, les Brenets, Switzerland, assignors to Seitz S. A., Les Brenets, Switzerland

Filed March 13, 1972, Ser. No. 233,989

Claims priority, application Switzerland, July 15, 1971, 10528/71

Int. Cl. G04b *13/02, 31/00*

U.S. Cl. 58—140 A **1 Claim**



The return-spring of the resiliently movable bearing cushion is permanently connected to the bearing body member by a hinge joint comprising hinging noses made integral with the spring and being locked in an annular recess of the bearing body member, under an outer rim of the recess inner wall, by a ring force-fitted in the recess outer wall. This ring leaves around the outer rim a slot having a width scarcely greater than the spring thickness and through which the spring hinging noses may be passed upon bending the spring out of its plane.

3,712,052

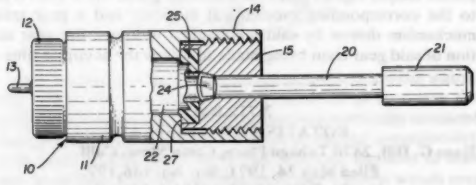
THERMAL ACTUATOR WITH CAPTIVE PISTON SHAFT AND SPECIAL SEAL

Marvin A. Staschke, Glendora, and Henry Kryczko, Upland, both of Calif., assignors to Thermal Hydraulics Corporation, Glendora, Calif.

Filed April 1, 1971, Ser. No. 130,175

Int. Cl. F03g *7/06*

U.S. Cl. 60—23 **7 Claims**



A thermal actuator comprising a pressure chamber, expansible material responsive to heat in the chamber, and a piston shaft driven by the expansible material, the shaft being slidable in a bearing in the actuator housing and having an enlarged

inner end which prevents complete ejection from the actuator by becoming embedded in the bearing in the event the shaft is expelled from the pressure chamber due to excessive pressure resulting from conversion of the expansible material from its liquid state to a gaseous condition by overheating. The piston shaft is slidable through a seal and polyethylene washer bearing on the pressure chamber side of the seal, said washer gradually coming into solution with and increasing the viscosity of the expansible material in the normal operation of the actuator.

3,712,053

THERMAL-MECHANICAL ENERGY TRANSDUCER DEVICE

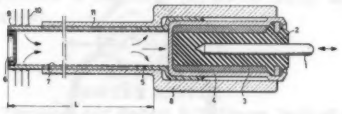
Siegfried Kofink, Lenzhalde 9, 7301 Zell, Germany

Filed April 27, 1970, Ser. No. 32,308

Claims priority, application Germany, May 3, 1969, P 19 22 728.2

Int. Cl. F28d *15/00*; **F03g** *7/06*

U.S. Cl. 60—23 **6 Claims**



To permit remote location of a thermal-mechanical energy transducer unit having a heat sensitive operating element, a heat pipe, such as a capillary tube containing therein a fabric, such as fiberglass fabric, and a vaporizable substance is connected in heat transfer relationship to the operating element to form a unitary device. The heat pipe having another terminal end adapted to be placed in a location where it can be heated, so that the heat pipe will upon heating of the other end above the vaporization temperature of the contents of the heat pipe, rapidly and effectively transmit heat from the source to the heat sensitive operating unit. To modify the transfer characteristics, the heat pipe may be insulated, wholly, or in part at the outside, to prevent heat loss during transmission, or to provide sharp on-off characteristics at predetermined temperatures, the temperatures being determined by the vaporization temperature of the filling of the heat pipe.

3,712,054

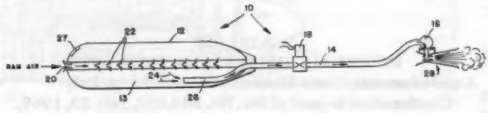
METHOD FOR SUPPRESSION OF HEAT RADIATION

Ephraim Regelson, Kensington, Md.; Howard I. Sumnicht, China Lake, and John D. Crecelius, Ridgecrest, both of Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Oct. 1, 1969, Ser. No. 866,073

Int. Cl. F02g *3/00*

U.S. Cl. 60—39.02 **1 Claim**



A radiation field is attenuated by dispersing in it a cloud of discrete particles. Several dust dispensers are disclosed for this purpose.

3,712,055

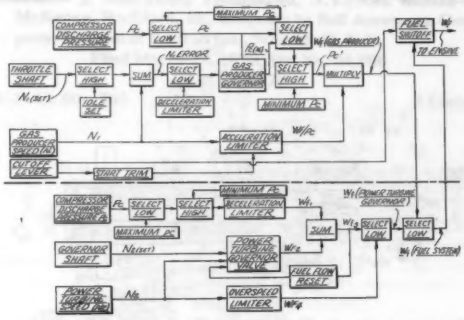
FUEL CONTROL

Ralph P. McCabe, Forest Park, Ohio, assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Feb. 1, 1971, Ser. No. 111,294

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 R **15 Claims**



A hydromechanical fuel control for a turboshaft engine includes a gas producer control and an independent power turbine governor in series flow relationship. The basic gas producer control includes an acceleration system, a deceleration system and all speed governor to regulate the fuel flow output of the gas producer control. The acceleration system includes a main metering valve which is positioned by a compressor discharge pressure responsive device and the all speed governor. A speed responsive computer mechanism controls the head across the metering valve. The computer mechanism includes an enrichment valve and a start valve and is connected to the shut-off valve lever for the fuel control in such a manner that the mechanism may be controlled by actuation of this lever. The power turbine governor includes a fuel flow reset governor and a deceleration system to prevent flameouts. The fuel control and power turbine each have separate input levers and meter fuel to the engine in accordance with the lowest demanded fuel flow.

3,712,056

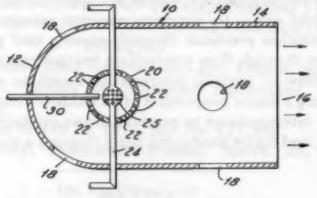
COMBUSTION CHAMBER FOR GAS TURBINE ENGINE

Richard A. Jeryan, Detroit, Mich., assignor to Ford Motor Co., Dearborn, Mich.

Filed April 13, 1971, Ser. No. 133,643

Int. Cl. F02c *7/00*

U.S. Cl. 60—39.65 **8 Claims**



Fuel and air are combusted within a spherical combustion chamber and the combustion products flow radially outward through the porous wall of the combustion chamber into an outer housing where the combustion products mix with secondary air. The short residence time of the actual combustion process improves combustor efficiency and reduces undesirable exhaust emissions.

3,712,057

CONTROL VALVE

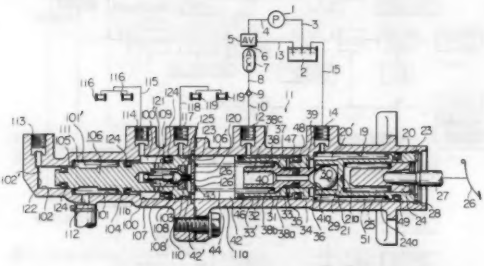
Shigeo Aiki; Masahoir Kito, and Atumi Ueda, all of Kariya, Aichi Pref., Japan, assignors to Aisin Seiki Kabrishiki Kaisha, Aichi Pref., Japan

Filed Aug. 25, 1970, Ser. No. 66,693

Claims priority, application Japan, Aug. 28, 1969, 44/68237

Int. Cl. F15b *7/00;* **B60t** *13/00, 8/18*

U.S. Cl. 60—54.5 P **10 Claims**



A control valve for an automotive vehicle hydraulic power brake system having a body with a bore and a differential piston reciprocable therein having an annular shoulder exposed to fluid pressure in the wheel-brake cylinders and a portion having a sectional area greater than that of the annular shoulder while receiving hydraulic pressure from the pressure source. Valve means in a passage formed in the piston is closed due to the shift of the piston at a predetermined pressure level whereby out-put pressure is boosted.

3,712,058

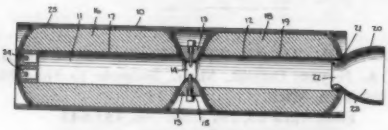
SOLID PROPELLANT CONTROLLED ROCKET MOTORS

Fredric M. Cooper, Chapel Hill, N.C., assignor to Northrop Carolina Inc., Swannanoa, N.C.

Filed Aug. 14, 1961, Ser. No. 131,216

Int. Cl. C06d *5/00*

U.S. Cl. 60—207 **8 Claims**



7. A method of rocket propulsion which comprises providing a solid grain containing a major proportion of a material which is partially decomposible into gaseous intermediates; igniting said grain to produce gaseous intermediate partial decomposition products thereof; passing said gaseous intermediates through flow controlling means; reacting said controlled flow of gaseous intermediates with an oxidizer grain containing a major proportion of an oxidizer reactive with said gaseous intermediates to product thrust-producing gases; and ejecting said thrust producing gases through a rocket nozzle.

3,712,059

REVERSE FLOW INTERNALLY-COOLED ROCKET ENGINE

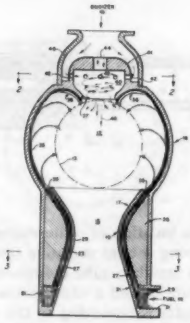
Martin G. Drexhage, Eggertsville, N.Y., assignor to Textron Inc., Providence, R.I.

Filed Dec. 3, 1970, Ser. No. 94,895

Int. Cl. F02k *9/02*

U.S. Cl. 60—258 **8 Claims**

An improved liquid or gas combusting type rocket engine operable to develop large gas volumes upon reactive engagement of fluids of the so-called fuel and oxidizer types: said engine including in combination, a combustion chamber section having a gas film-cooled inner wall surface configuration of continuous positive curvature and a nozzle section having internally cooled convergent, throat, and divergent exit wall portions. One of the reactant fluids is fed into the inlet end of the combustion chamber section in two separate fractions; one fraction being introduced through a swirl or vortex generating injection system, and the other fraction being straight-line injected through the center of the vortex and along the center lines of the combustion chamber and thrust exit nozzle portions. The other reactant fluid is introduced through a manifold which encircles the exit end of the nozzle and delivers into passageways formed internally of the nozzle wall structure and extending lengthwise thereof, which in turn deliver the fluid into the combustion chamber in such fashion as to flow in the form of a film closely adhering to the wall thereof while travelling from the outlet end toward the inlet end thereof. The inlet end of the combustion chamber is torus



shaped, whereby a central opening is provided for passage therethrough of the combination swirl and straight-line charge of the first mentioned reactant fluid. This chamber shape ensures that the film of the second mentioned fluid continues to flow tightly against the entire length of the combustion chamber until it is cascaded back into the chamber and into intimate admixture with the first mentioned fluid as it exits from its injection system. Thus, the second mentioned fluid operates as a highly efficient coolant for both the nozzle and combustion chamber sections, and then enters into reaction with the first fluid in such a manner as to provide for a greatly improved reaction efficiency. Typically, the fluid operating as the coolant will be a fuel such as hydrogen; and the fluid entering the combustion chamber through the whirl injector system will be an oxidizer, such as oxygen. The invention is particularly suited for installation and operation within an environment of closely adjacent hardware (structural or mechanical, or electrical components, etc.) such as cannot tolerate heating.

3,712,060

INTERNAL COMBUSTION JET ENGINE

Angelo Sorrenti, Corso Moncalieri 466/6, Turin, Italy

Continuation-in-part of Ser. No. 844,058, July 23, 1969, abandoned. This application July 26, 1971, Ser. No. 164,804

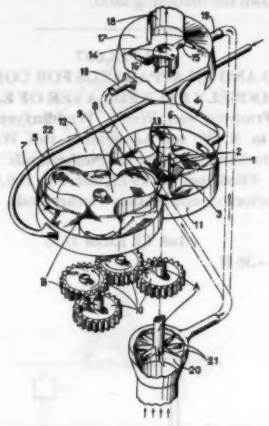
Claims priority, application Italy, May 13, 1969, 51824 A/69

Int. Cl. F02k *11/00*

U.S. Cl. 60—269 **9 Claims**

An internal combustion jet engine wherein the driving force

is obtained form the escaping burnt gases which expand due to combustion effected at at least two diametrically opposite

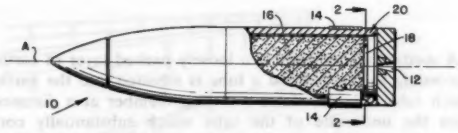


nozzles to produce a tangential peripheral thrust as in a hydraulic impeller.

3,712,061
VORTEX BAFFLE

Kenneth G. Thorsted, and Robert B. Dillinger, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 2, 1966, Ser. No. 593,260
Int. Cl. F02k *9/04*
U.S. Cl. 60—253 **2 Claims**

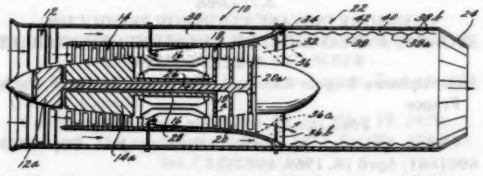


Spin stabilized rocket motor with end burning solid propellant grain in which cratering of the grain is eliminated by channeling gaseous products of combustion through angularly spaced apertures disposed outwardly from the rocket axis and thence radially inwardly to an axially disposed exhaust nozzle.

3,712,062
COOLED AUGMENTOR LINER

Dudley O. Nash, Cincinnati, Ohio, assignor to General Electric Company

Filed April 17, 1968, Ser. No. 721,992
Int. Cl. F02k *3/10*
U.S. Cl. 60—261 **7 Claims**

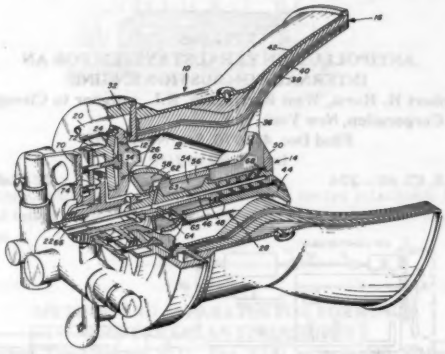


A liner for a combustion zone, particularly the thrust augmentor of a jet engine which has longitudinally spaced circumferential corrugations and slot film cooling means at the radially inward portions of each corrugation. The corrugations minimize stress buildup due to circumferential thermal gradients and provide self-support while the slot cooling means allows such corrugations to be used without overheating of the liner. The cooling means may be formed of a corrugated circumferential strip between liner sections.

3,712,063
COOLED PINTLE ASSEMBLY

Stanislaw J. Andrysiak, Youngstown, N.Y., and Ronald F. McKenna, Rockford, Ill., assignors to Bell Aerospace Company, Division of Textron Inc., Wheatfield, N.Y.

Filed March 24, 1970, Ser. No. 24,900
Int. Cl. F02k
U.S. Cl. 60—265 **5 Claims**



To maintain a constant pressure in the combustion chamber of a rocket engine, which operates with either liquid and/or metallized propellants, a cooled throat pintle assembly is provided to vary the throat area in an E-D nozzle. The pintle design is a composite structure consisting of a Columbium alloy central rod member having in its cylindrical and injector portions a Grafoil intermediate layer and a Carbitex outer layer. The throat portion of the pintle assembly consists of stacked pyrolytic graphite washers having a spiral formed coolant passages. The throat, cylindrical, and injector portions of the pintle are gas film cooled with fuel-rich gases that are ducted through the center of the pintle from a pressurization system gas generator. The injector or forward end of the pintle is cooled by a gas film exiting from the pintle housing. The throat portion of the pintle is cooled by gases exiting through spiral grooves in the washers.

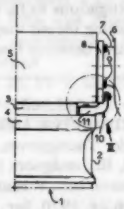
3,712,064
DEVICE FOR A CLAMPING AND LOOSENING THE EXHAUST MANIFOLD ON INTERNAL COMBUSTION ENGINES

Karl Walter Kuhn, Saint Germain-en-Laye, France, assignor to Societe D. Etudes De Machines Thermiques, Saint-Denis, France

Filed March 24, 1971, Ser. No. 127,705
Claims priority, application France, March 25, 1970, 7010784
Int. Cl. F01n *7/18*
U.S. Cl. 60—272 **20 Claims**

Mounting device for maintaining in proper position and possibly loosening or detaching the exhaust manifolds during removal of the sealing gaskets of the manifolds and/or the cylinder heads of internal combustion engines, comprising at least one supporting bracket for example at least approximately in the shape of a corner plate mounted upon the engine casing or cylinder block outside of but near the cylinder head and

removably carrying the inlet end and in particular the fastening flange connecting said manifold to the cylinder head to



hold it against motion and preferably spreading means associated with said supporting bracket for detaching or separating said flange from said cylinder head.

3,712,065

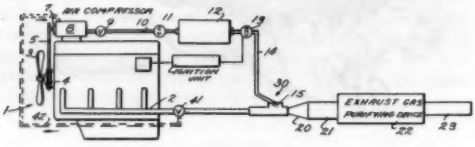
ANTIPOLLUTION EXHAUST SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Robert H. Hurst, West Barrington, R.I., assignor to Clevepak Corporation, New York, N.Y.

Filed Dec. 4, 1970, Ser. No. 95,319

Int. Cl. F01n *3/10*

U.S. Cl. 60—274 **20 Claims**



A system for reducing the back pressure on the exhaust valves of an internal combustion engine which includes, for instance, a source of compressed air, which may be powered by the internal combustion engine, and, in particular, a unique momentum transfer pump device which utilizes the high pressure compressed air output to create a suction or lower pressure at the exhaust manifold. A diffuser may be connected at the output end of the momentum pump to further increase the efficiency of the momentum pump.

3,712,066

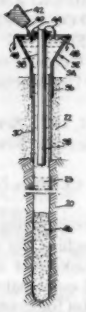
FILLING SAND DRAIN HOLES

Carl Daniel Hartzell, Oakland, N.J., assignor to Raymond International, Inc., New York, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,550

Int. Cl. E02b *11/00*; E02d *5/34*

U.S. Cl. 61—11 **14 Claims**



A water filled sand drain hole is filled with sand by pouring the sand down through a conduit extending into the hole while water rises up from the hole outside the conduit and a portion of the rising water is directed over into the conduit to mix with and flush down the incoming sand.

3,712,067

METHOD AND AN APPARATUS FOR COMPACTING A LOOSELY PACKED LAYER OF EARTH

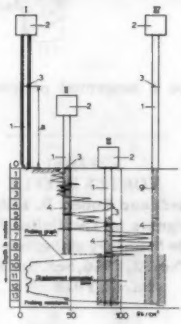
Abraham Francois van Weele, Waddinxveen, Netherlands, assignor to N. V. tot Aanneming van Werken Voorheen H. J. Nederhorst, Gouda, the Netherlands

Filed Jan. 13, 1971, Ser. No. 106,090

Claims priority, application Netherlands, Jan. 14, 1970, 7000539

Int. Cl. E02d *3/06*

U.S. Cl. 61—36 R **11 Claims**



A method of compacting a loosely packed layer of earth. According to this method a tube is vibrated into the earth, which tube accommodates a closing member at a distance from the underside of the tube which substantially corresponds to the distance from the ground level to the upper side of the layer of earth to be compacted. Earth is received in the tube while this tube is being vibrated into the earth, until this earth within the tube strikes the closing member at the time that the underside of the tube has reached approximately the upper side of the layer of earth to be compacted. Hereupon, in the further course of the tube being vibrated downwardly to the required depth, earth is displaced in the layer of earth to be compacted, whereafter the tube is vibratingly lifted and the earth which has been received in the tube leaves the tube and is left in the ground.

An apparatus for carrying out this method consists of a tube within which a closing member is accommodated at the appropriate distance from the underside of the tube. This closing member is pervious to air.

3,712,068

OFFSHORE INSTALLATION FOR PRODUCING, STORING AND LOADING OIL FROM UNDERWATER OIL WELL

Jean Alphonse Eugene Lisutaud, 49 Avenue de Segur, Paris, France

Filed Jan. 22, 1970, Ser. No. 5,087

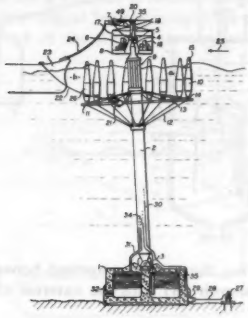
Claims priority, application France, Jan. 30, 1969, 6901861; April 18, 1969, 6912101

Int. Cl. E02b *17/00*; E02d *27/04*

U.S. Cl. 61—46.5 **11 Claims**

An offshore installation for the production, storage and loading of oil from an underwater source. Installation includes an immersed storage tank, a vertical column connected at its

bottom to the tank by a universal joint and having its top above the water surface. platform is connected to upper end



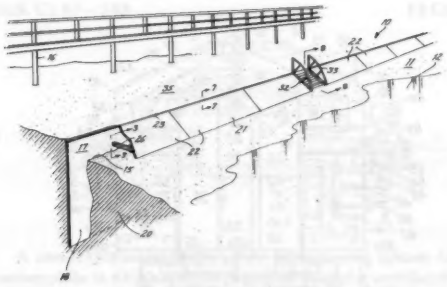
of column. Column is maintained in vertical orientation by circularly arranged distributed buoyancy means connected thereto.

3,712,069

BEACH PROTECTION SYSTEM

Niels P. Rasmussen, 7th Street at Delaware River, Camden, N.J.

Filed March 22, 1971, Ser. No. 126,541
Int. Cl. E02b *3/06*
U.S. Cl. 61—49 4 Claims



A beach protection system wherein a bulkhead upstands from a beach extending generally along the high water line, and a ramp, slope or declining wall extends from the bulkhead obliquely downward to ground level on the seaward side of the bulkhead, ground level on the inland side of the bulkhead being raised to approximately the height of the bulkhead.

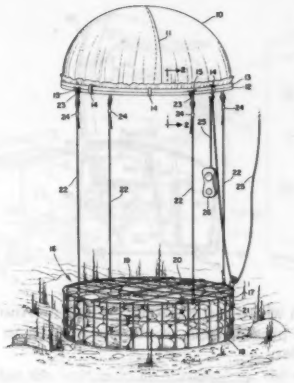
3,712,070

SMALL PORTABLE UNDERWATER OBSERVATION AND COMMUNICATION CHAMBER

Joseph Beverly Macinnis, 21 McMaster Avenue, Toronto, 190 Ontario, Canada

Continuation-in-part of Ser. No. 38,931, May 19, 1970, abandoned. This application Nov. 18, 1971, Ser. No. 199,843
Int. Cl. B63c *1/00*
U.S. Cl. 61—69 R 12 Claims

A portable underwater air retention chamber comprising; air container means having an access opening sufficient at least to receive the head of a diver; tether means attachable to said container means to locate the same in position underwater with said access opening means directed downwardly and defining a predetermined spacing



therebeneath, and, removable mooring means attachable to said tether means for securing the same in an underwater location.

3,712,071

METHOD AND APPARATUS FOR FORMING SUBTERRANEAN STRUCTURES

Vernon Cunningham, P.O. Box 9337 - Springhill Station, South Charleston, W. Va.

Division of Ser. No. 823,407, May 9, 1969, Pat. No. 3,578,809. This application May 5, 1970, Ser. No. 46,566
Int. Cl. E21d *11/00*
U.S. Cl. 61—85 1 Claim

A multi-section shield incorporates means for subterranean excavation and conveyance of excavated materials and provides for the installation of the lining planks within the shield. This apparatus is employed in a system of tunnel or conduit lining wherein floor and roof planks are prepositioned and side wall planks are wedged in place therebetween.

The method of tunnel or conduit formation herein involved provides for the installation of lining within a shield, and for subsequent advance of the shield.

3,712,072

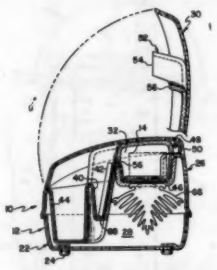
COOLING DENTAL MATERIALS

Henri H. Hoge, Baltimore, Md., and Gilbert A. Wadsworth, Cockeysville, Md., assignors to Rhomega Systems, Inc., Cockeysville, Md.

Filed April 23, 1971, Ser. No. 136,855
Int. Cl. F25b *21/02*
U.S. Cl. 62—3 6 Claims

There is disclosed apparatus for cooling dental materials preparatory to mixing a thermoelectric cooling device is

disposed in cooling relation to a support for receptacles containing the dental material and in cooling relation to a removable platform on which the materials are mixed. Another mixing platform is provided out of cooling relation to the thermoelectric cooler.



3,712,073

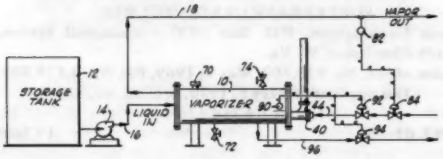
METHOD AND APPARATUS FOR VAPORIZING AND SUPERHEATING CRYOGENIC FLUID LIQUIDS

Edwin M. Arenson, El Reno, Okla., assignor to Black, Sivalls & Bryson, Inc., Oklahoma City, Okla.

Filed Feb. 3, 1971, Ser. No. 112,174

Int. Cl. F17c 7/02

U.S. Cl. 62—52 **9 Claims**



The present invention relates to methods and apparatus for economically vaporizing and superheating a stream of cryogenic fluid liquid. A body of heating medium liquid is heated in a closed vessel so that portions thereof are continuously vaporized. The stream of cryogenic fluid liquid to be vaporized and superheated is passed through a heating coil disposed within the vessel in heat exchange relationship with both the liquid and vapor portions of the heating medium so that the cryogenic fluid is vaporized and superheated to a desired level and so that vaporized heating medium is continuously condensed and returned to the liquid portion thereof.

3,712,074

CRYOGENIC GAS TRAP

Jean-Claude Boissin, 38 Montbonnot-Saint-Martin, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed April 13, 1971, Ser. No. 133,595

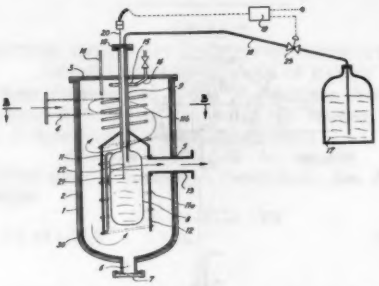
Claims priority, application France, April 17, 1970, 7013893

Int. Cl. B01d 5/00

U.S. Cl. 62—55.5 **6 Claims**

The invention is concerned with cryogenic traps having a large trapping range.

They comprise a reservoir (**8**) for a cryogenic liquid, and connected at the upper part thereof, a tube (**11**). The tube (**11**) is wound from the bottom to the top at **11***a* about a metallic hood (**12**) coaxial to the reservoir (**8**), then at **11***b* above said hood (**12**). These members are placed altogether in a housing (**30**) comprising at level **11***b*, an input pipe (**4**) for a gaseous flow, and at the upper level of the reservoir (**8**), an evacuation opening (**5**), the edges of which are in contact with a tube (**13**) linking the space comprised between the hood (**12**) and the reservoir (**8**) with the exterior of the housing (**30**).



3,712,075

APPARATUS FOR PERFORMING THE IMMISCIBLE REFRIGERANT FREEZE PROCESS FOR PURIFYING WATER

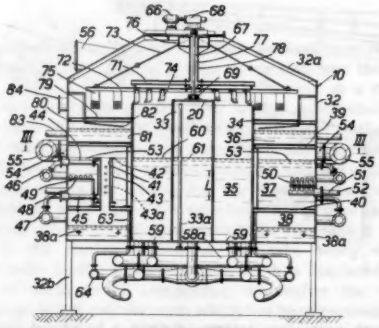
Michael John Stapley Smith, Boars Hill; John Henry Wilson, Stockport, and Bryan Reginald Parr, Sale, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 18, 1970, Ser. No. 99,332

Claims priority, application Great Britain, Dec. 30, 1969, 63,404/69

Int. Cl. B01d 9/04

U.S. Cl. 62—123 **12 Claims**



Plant for performing the immiscible refrigerant freeze process for purifying water has a crystallizer section with two sub-sections. The first sub-section forms a refrigerant injection zone in which ice crystal slurry is produced. The second sub section forms a disengagement zone in which entrained refrigerant is removed from the slurry and ice crystals are allowed to grow before transferring the slurry to the brine separating and washing section of the plant.

3,712,076

AUTOMATIC ICE MAKER SWITCH CONTROLS

William L. Fox, Niles, Ill., assignor to Eaton Yale & Towne Inc.

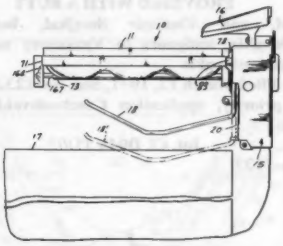
Continuation-in-part of Ser. No. 762,891, Sept. 26, 1968, Pat. No. 3,563,050. This application Nov. 13, 1969, Ser. No. 876,337

Int. Cl. F25c 1/10

U.S. Cl. 62—137 **25 Claims**

A completely automatic ice cube maker which is driven through successive water fill cycles, freeze cycles and harvest

cycles by a continuously operating permanent magnetic synchronous electric motor. Water is delivered to a plastic ice cube tray during the water fill cycle and the water in the tray is frozen during a freeze cycle of predetermined duration. During the harvest cycle the tray is rotated about its longitudinal axis through 360° but at approximately the mid-point of this rotation one end of the tray is arrested momentarily in its



movement whereby a twisting action is applied to the tray to dislodge the cubes therefrom. The cubes drop into an ice collection basket and prior to each harvest cycle an ice level sensing mechanism operates to determine whether an excessive quantity of cubes have been collected in the basket and if so operates to deenergize the ice cube maker until the quantity of cubes in the basket has been reduced.

3,712,077

AUTOMOBILE AIR CONDITIONING SYSTEM

Don P. Dixon, P.O. Box 18237, Serna Station, San Antonio, Tex.

Filed Sept. 10, 1971, Ser. No. 179,364
Int. Cl. B60h *3/04*
U.S. Cl. 62—243 **12 Claims**

A condenser assembly of an air conditioning system for an automobile in which a coil is mounted behind a ventilated grill across the front end of the automobile with its upper end opposite the front end of a spare tire compartment spaced rearwardly of the upper portion of the grill, and a fan is mounted in a space between the lower portion of the grill and a frame wall below and spaced rearwardly of the front end of the spare tire compartment so as to draw air through the coil.

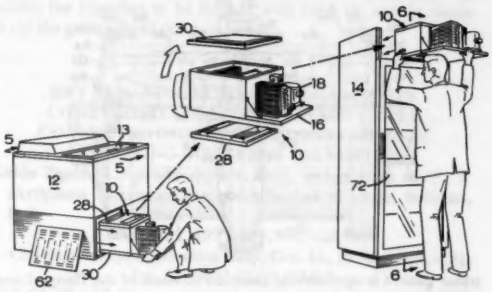
3,712,078

REFRIGERATION UNIT

James G. Maynard, Toronto, Ontario, and George F. Brown, Agincourt, Ontario, both of Canada, assignors to Krispin Engineering Limited, Don Mills, Ontario, Canada

Filed Nov. 22, 1971, Ser. No. 201,050
Int. Cl. F25d *19/02*
U.S. Cl. 62—448 **4 Claims**

This invention relates to a refrigerator and to a refrigerating unit for a refrigerator that can be adapted by minor adjustment for mounting in refrigerating cabinets of different design. Essentially the refrigerating unit is a complete unit that has a chamber for the heat exchanger with two openings of similar perimeter design; covers are provided which can be fitted over either opening. One of the covers is solid and the other has an inlet and outlet opening designed to permit the ingress of air to the heat exchanger and the exit of air from the heat exchanger. Depending upon the type of refrigerated



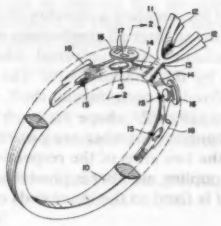
cabinet that the unit is to be installed in, the cover with the inlet and outlet openings is mounted on one or other of the openings in the chamber that houses the heat exchanger.

3,712,079

RING OF TWO PRECIOUS METAL PARTS, ONE OVERLAPPING AND EMBEDDING THE OTHER ALONG THE RING BAND PORTION

Otto Eugen Eberle, 421 Guildwood Parkway, Westhill, Ontario, Canada

Filed Nov. 9, 1970, Ser. No. 87,928
Int. Cl. A44c *9/00*
U.S. Cl. 63—15 **3 Claims**



An article of jewelry or the like formed of at least two precious metals in which a first precious metal part formed with at least some hidden portion which cannot be seen in the finished article, keying means formed on the hidden portion and a second precious metal part cast in a molten state around the hidden portions of the first part and set in engagement therewith. In so making a ring, one precious metal part constitutes the ring mounting and its hidden portion extends beyond the mounting area at least partly around the finger.

3,712,080

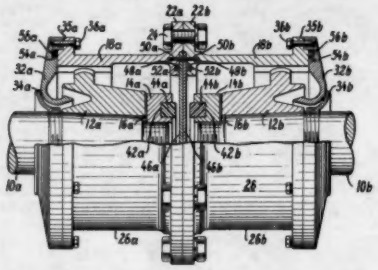
SHAFT COUPLING DEVICE

Junichi Shigeura, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1970, Ser. No. 63,800
Int. Cl. F16d *3/18*
U.S. Cl. 64—9 R **2 Claims**

The coupling device is composed of two flanged halves each having an internal gear encircling an external gear secured to each of driving and driven shafts. The flanged end is sealed by a resilient disc and the other end is sealed by a cover and a

dust keeper. Both the halves can be fastened together by bolts extending through the flanges and the associated nuts. One annular gasket is operatively coupled to each of the flanged and other ends and has no fastening screws extending through it.



3,712,081

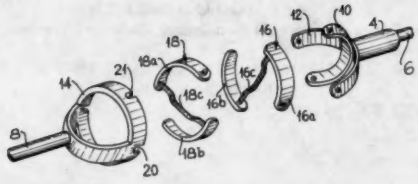
UNIVERSAL JOINT FOR COUPLING A PLURALITY OF SHAFTS

Gabriel Philipp, Ein Geddi St. 2/11, Holon, and Stephan Braun, Hagalil St. 1/8, Carmiel, both of Israel

Filed Jan. 11, 1971, Ser. No. 105,219

Int. Cl. F16d *3/16*

U.S. Cl. 64—17 R **3 Claims**



A universal joint for coupling a plurality of coaxial shafts to a common shaft; also an internal combustion engine of the rotary vane type including such universal joint in which the vanes are carried by the coaxial shafts. The universal joint comprises a fork fixed to each coaxial shaft, and a coupling member of substantially "Z" shape for each shaft. The two outer legs of the coupling member are pivotably mounted at the outer ends to the two arms of the respective fork, and the center leg of the coupling member is pivotable coupled to the common shaft and is fixed to the inner ends of the two outer legs.

3,712,082

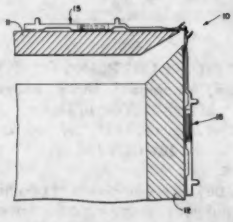
DIAL AND CYLINDER KNITTING MACHINE HAVING SELF-FRICTIONING NEEDLES

Alfred O. Kohorn, 862 Wycoff Avenue, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 854,901, Sept. 3, 1969, abandoned. This application June 23, 1971, Ser. No. 156,056

Int. Cl. D04b *9/06, 35/04*

U.S. Cl. 66—19 **5 Claims**



A circular dial and cylinder type knitting machine having narrow needle grooves and a thin guage straight unbent needle in each groove pressed against one groove side by a spring carried by the needle in a slot in its side, the spring engaging the opposite groove side, in all positions of the needle; a needle as described.

3,712,083

WORKING ELEMENT OF A KNITTING MACHINE PROVIDED WITH A BUTT

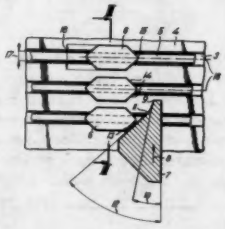
Alois Slof, and Vladimir Smejkal, both of Brno, Czechoslovakia, assignors to Vyzkumny ustav pletarsky, Brno, Czechoslovakia

Filed March 12, 1971, Ser. No. 123,622

Claims priority, application Czechoslovakia, March 17, 1970, 1736

Int. Cl. D04b *35/02*

U.S. Cl. 66—123 **20 Claims**



A knitting machine having a working element such as a needle or closing sinker provided on its shaft with at least one butt cooperating with cams actuating the movement of the working elements, the functional surface of the butt having a rounded part and a planar part, the planar part being oblique to the longitudinal axis and substantially parallel with the functional surface of the cam, the functional surface of the butt substantially exceeding the width of the shaft.

3,712,084

JACQUARD PATTERN CONTROLLER STRUCTURE

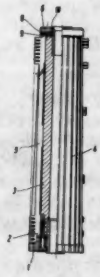
Falk Kuhn, Kiebingen, Germany, assignor to Fouquet-Werk Frouz & Planck, Rottenburg am Neckar, Germany

Filed Oct. 21, 1971, Ser. No. 191,179

Claims priority, application Germany, Dec. 4, 1970, P 20 59 645.6

Int. Cl. D04b *15/66*

U.S. Cl. 66—156 **6 Claims**

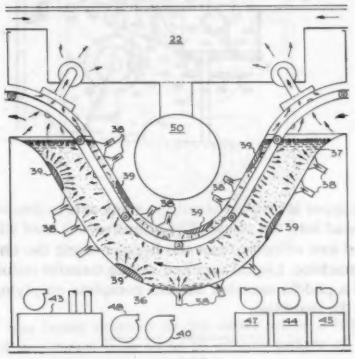


A substantially cylindrical drum-shaped holder has axially extending grooves cut therein. The holder is capped off by a cover which has a resilient insert therein, so that pattern jacks can be individually inserted into the grooves, and snapped in place by pressure against the resilient insert, with the cover remaining on the cylindrical holder.

3,712,085
ULTRA-SONIC DRY-CLEANING MACHINE

Jerald Guberman, Los Angeles, Calif., and Alvin A. Snaper, Las Vegas, Nev., assignors to Advanced Patent Technology, Inc., Las Vegas, Nev.

Filed March 11, 1971, Ser. No. 123,351
Int. Cl. D06f *43/06, 43/08*
U.S. Cl. 68—3 SS 8 Claims

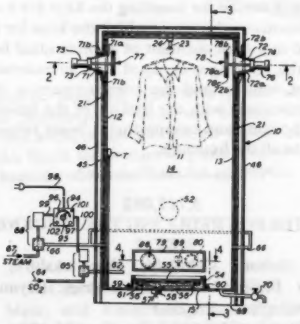


This invention provides a new approach to the dry-cleaning of garments and fabrics by using ultra-sonic energy as to the cleaning force. The garment first enters a pair of air compartments which prepare the garment for the wash tank. In the wash tank, which is filled with a liquid solvent, transducers in the wall of the tank apply ultra-sonic energy to the garment to clean it. Upon emergence from the tank, the garment again passes through compartments which first dry the garment and then cool it.

3,712,086
APPARATUS FOR PRODUCING A DURABLE PRESS IN GARMENTS CONTAINING CELLULOSE OR CELLULOSIC DERIVATIVES

George L. Payet, Cincinnati, Ohio, and John H. Forg, Cincinnati, Ohio, assignor to McGraw-Edison Co., Elgin, Ill.

Division of Ser. No. 846,884, Aug. 1, 1969, Pat. No. 3,660,013.
This application Oct. 26, 1971, Ser. No. 192,285
Int. Cl. D06c *1/00*
U.S. Cl. 68—5 C 10 Claims

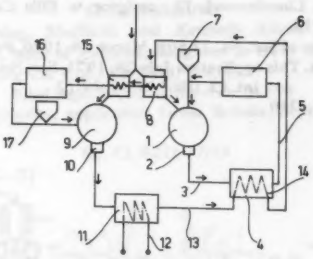


A novel apparatus for treating fabric articles containing cellulosic material to impart thereto a durable press comprises a treating chamber having means for providing therein formaldehyde and sulphur dioxide gases, and steam according to the weight of the cellulosic material in the fabric articles being treated, and for then cutting off the steam and supplying dry heat to raise the temperature in the chamber to at least 250°F Further, the chamber has suitable blowers and air ducts to enable the chamber to be flushed with fresh air and/or steam to rid the garments of residual odors.

3,712,087
DRY CLEANING SYSTEM FOR GARMENTS COMPRISING A NUMBER OF WASH TANKS CONNECTED INTO INDEPENDENT CIRCUITS UTILIZING DIFFERENT SOLVENTS

Guido Zucchini, Castelmaggiore, Italy, assignors to A. M. A. (Artigiana Meccanici Associati) Societa di Fatto, Bologna, Italy

Filed Oct. 1, 1971, Ser. No. 185,739
Claims priority, application Italy, Oct. 16, 1970, 3589 A/70
Int. Cl. D06f *43/04, 43/08*
U.S. Cl. 68—18 C 5 Claims

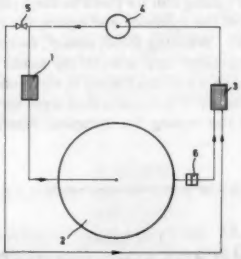


A dry cleaning solvent wash tank comprising independent circuits utilizing different solvents of different boiling points wherein the heat input for lower boiling solvent recovery by distillation is partly supplied from the latent heat of condensation of a higher boiling solvent and wherein part of the heat of condensation serves to preheat the air introduced into the drums of the washing and drying cycle of the lower boiling solvent to aid in drying the garments so treated.

3,712,088
TEXTILE DRY CLEANING MACHINE

Walter Jaeger, Wilhelmstrasse 33, Neureut bei Karlsruhe, Germany

Filed Nov. 12, 1970, Ser. No. 88,820
Int. Cl. D06f *43/08*
U.S. Cl. 68—18 C 2 Claims



In a textile dry cleaning machine having a system for recirculating air in a closed cycle through a heating station, through a drum wherein a textile to be cleaned is contacted with cleaning fluid and thereafter spin-dried, and then through a cooling station to vaporize and recover residual cleaning fluid remaining in the textile after spin-drying, the provision in the air recirculating system of a regulatable branch path bypassing the heating station and drum for feeding a controlled

proportion of the circulated air stream containing vaporized cleaning fluid directly to the cooling station along with the part thereof fed to the cooling station through the heating station and drum. Increase in efficiency of fluid recovery is obtained thereby, as a result of the temperature differential between the two parts fed to the cooling station. The recovery system is particularly useful and economical for dry cleaning machines which work with derivatives of the methane and ethane series as cleaning fluid, and can also be applied with advantage to machines that work with tri- or tetrachloroethylene.

3,712,089

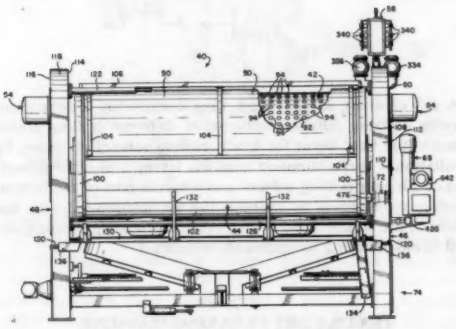
COMMERCIAL LAUNDRY MACHINE AND RELEASABLE CONNECTIONS THEREFOR

Alex Toth, Lincolnwood, Ill., assignor to Ellis Corporation, Chicago, Ill.

Division of Ser. No. 22,508, March 25, 1970, Pat. No. 3,613,406. This application July 28, 1971, Ser. No. 166,720

Int. Cl. D06f *35/00, 39/12*

U.S. Cl. 68—210 **11 Claims**



A commercial laundry machine includes an inner perforated cylinder and an outer casing both mounted on a pair of end frames for rotation about their common central axis. The cylinder is rotated during washing operations, and the casing is fixed to the end frames, thereby to hold the casing stationary. Alternatively the casing can be fixed to the cylinder for simultaneous rotation of the cylinder and casing for loading and unloading of laundry. Washing fluid, steam, electrical and pressurized air connections are selectively made from the end frames to the casing when the casing is stationary by means of connection structures. The connection structures are released in order to free the casing for rotation relative to the end frames.

3,712,090

LAUNDRY MACHINE AND LOADING STRUCTURE THEREFOR

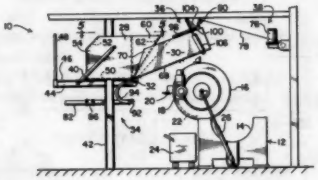
Alex Toth, Lincolnwood, Ill., and Robert H. Fesmire, Barrington, Ill., assignors to Ellis Corporation, Chicago, Ill.

Division of Ser. No. 95,849, Dec. 7, 1970. This application Feb. 7, 1972, Ser. No. 223,985

Int. Cl. D06f *39/12*

U.S. Cl. 68—210 **4 Claims**

A commercial laundry machine receives a prewetted laundry load from a hopper by way of a transfer chute. The initially dry load is placed into a hopper while the hopper is in an upright position, and the hopper is supplied with liquid in order to wet the load. A pivotally mounted transfer chute is normally spaced from the machine to permit access, unloading and the like. The chute is pivoted into loading position wherein it is disposed at an acute angle relative to horizontal,



and the hopper is pivoted about the same axis to discharge the laundry load into the chute. The cohesive wet load slides at a controlled low velocity from the hopper along the chute and into the machine. Liquid supplied during transfer reduces friction, and a paddle member assures complete emptying of the load into the machine.

3,712,091

METHOD AND DEVICE FOR HANDLING MOTOR VEHICLE KEYS

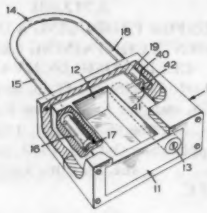
Ronald Joseph Parent, 25 Dundurn Crescent, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 822,842, April 14, 1969, abandoned. This application Jan. 4, 1971, Ser. No. 103,739

Claims priority, application Canada, April 8, 1970, 079527

Int. Cl. E05b *65/48*

U.S. Cl. 70—63 **2 Claims**



A method and device for handling the keys for a number of different automotive vehicles, in which the keys for each vehicle are placed in a compartment of an individual housing for that vehicle, the housing is engaged with an external bridging fixture of that vehicle, and the compartment is closed and locked simultaneously with the locking of the housing on the fixture, each housing and compartment being releasable by a key common to all the housings.

3,712,092

APPARATUS FOR REDUCING THE THICKNESS OF METAL

Karel Saxl, Sutton, Coldfield, Warwickshire, England, assignor to Imperial Metal Industries (Kynoch) Ltd., Witton, Birmingham, England

Filed Oct. 26, 1971, Ser. No. 192,159

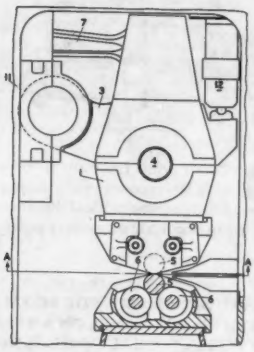
Claims priority, application Great Britain, Nov. 9, 1970, 53,122/70

Int. Cl. B21b *33/00*

U.S. Cl. 72—1 **7 Claims**

Apparatus for reducing thickness of metal having a pair of oscillatable arms having workrolls on adjacent free ends one

on each side of a passline for metal, each arm being pivotable between spaced-apart supporting beams which are interengaged by a shaft which allows for limited angular move-



ment of one beam relative to the other when a load safety device of one beam fails so as to ensure failure of the load safety device of the other beam.

3,712,093

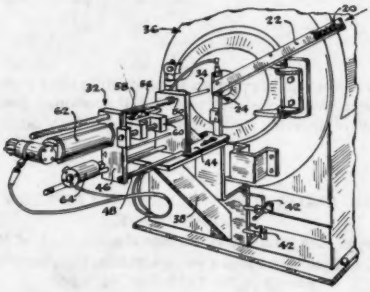
APPARATUS FOR HANDLING CYLINDRICAL BLANKS

Martin L. Rackow, Janesville, Wis., assignor to The Parker Pen Co., Janesville, Wis.

Filed Jan. 25, 1971, Ser. No. 109,394

Int. Cl. B21d *55/00, 43/00*

U.S. Cl. 72—3 **3 Claims**



Apparatus for handling cylindrical blanks where an infeed mechanism successively feeds the blanks into a forming machine and a check on the infeed varies the presentation speed of the blank for hammering and a removal mechanism strips the hammered blanks from the apparatus.

3,712,094

GEAR ROLLING MACHINE

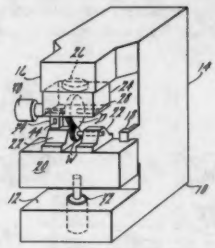
Carl H. Motz, and Russell W. Anthony, both of Harper Woods, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Feb. 4, 1971, Ser. No. 112,706

Int. Cl. B21h *5/02*

U.S. Cl. 72—21 **8 Claims**

Machine for rolling a gear with a gear-like die which includes means for measuring and/or controlling the final



separation between the axes of the gear and die so as to produce uniform size finish-rolled gears.

3,712,095

SLAB ROLLING

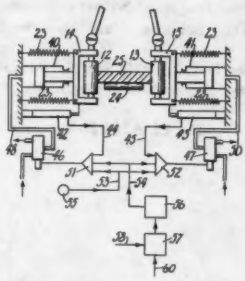
John Dowsing, Sheffield, and Kenneth Alfred Yeomans, Worksop, both of England, assignors to Davy and United Engineering Co. Ltd., Sheffield, England

Filed Sept. 23, 1970, Ser. No. 74,594

Claims priority, application Great Britain, Sept. 26, 1969, 47611/69

Int. Cl. B21b *37/14*

U.S. Cl. 72—21 **3 Claims**



When rolling a steel slab along its edges to reduce its width the head end of the slab may experience a larger percentage reduction than the mid portions of the slab. A similar situation, but to a less marked extent may occur at the tail end of the slab. To avoid this disadvantage workpieces are rolled in a vertical mill stand and the roll gap of the mill stand is automatically controlled during rolling. In the combination of a vertical mill stand and a horizontal mill stand in which slabs are successively edge and flat rolled an automatic control system is employed to control means for adjusting the roll gap of the vertical stands during the rolling of at least a terminal length of the slab adjacent an end so as to produce a width profile such that after subsequent horizontal rolling the width of the terminal length is not less than the width of the remainder of the slab.

3,712,096

GRIPPING HEAD FOR GRIPPING A WORKPIECE TO BE SWAGED

Johann Braunwieser, Madlsederstrabe 13, Steyr; Othmar Heimel, Wachtberg 98, Behamberg, and Otto Hein, Resselstrabe 16, Steyr, all of Austria

Filed July 13, 1970, Ser. No. 54,529

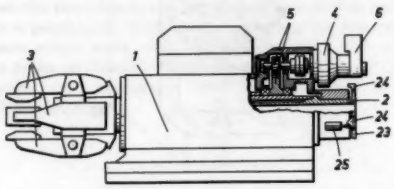
Claims priority, application Austria, July 28, 1969, A 7242/69

Int. Cl. B21b *37/08;* **B21d** *43/02*

U.S. Cl. 72—28 **9 Claims**

A spindle is rotatably mounted in a gripping head body. Gripping jaws are mounted on said spindle for rotation

therewith and adapted to grip a workpiece to be swaged by periodic hammer blows. A hydraulic motor is operatively connected to said spindle and operable to rotate the same. Valve means are movable between first and second positions and arranged to control said hydraulic motor to rotate said spindle in



a first direction when said valve means are in said first position and in a second direction, which is opposite to the first, when said valve means are in said second position, and valve control means for cyclically moving said valve means between said first and second positions at a cycle frequency which is equal to the frequency of said hammer blows.

3,712,097

DEVICE FOR THE MANUFACTURE OF A BRANCH TO A STRAIGHT TUBE

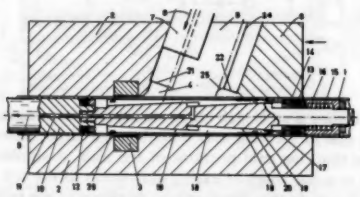
Arie Verkaik, Maasslius, and Cornelis Leendert Funcke, Apeldoorn, both of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurwelenschappelyk Onderzaek Ten Behoeve Van Nyverheid, Handel En Verkeer

Filed Dec. 2, 1970, Ser. No. 94,430

Claims priority, application Netherlands, Dec. 17, 1969, 6918975

Int. Cl. B21d *26/04*

U.S. Cl. 72—60 **1 Claim**



The invention relates to a device for the manufacture of at least one branch to a tub comprising a splitted die provided with a channel for the tube, an external clamp for the tube at one side of the die, a cavity for the branch and an additional cavity at the other side of the die in which a movable die part is provided, and a mandrel equipped with an internal clamp for the tube on the spot of the movable die part, which mandrel together with the movable die part is movable in the direction of the external clamp in order to upset the tube between the clamps so that the material of said tube bulges in the cavity to form a branch.

3,712,098

PULLEY FORMING MECHANISM

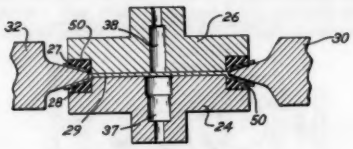
Samuel Ralph Shaffer, Jeffersonville, and Earl D. Scott, Walkerton, both of Ind., assignors to Arrowhead Engineering Corporation, Knox, Ind.

Filed July 15, 1971, Ser. No. 162,867

Int. Cl. B21h *1/04*

U.S. Cl. 72—71 **15 Claims**

A machine for forming pulleys from a disc shaped metal blank in which the blank is clamped between two rotating backer blocks and one or more tool means are used to split the periphery of the disc shaped blank and to press the flanges formed by the split laterally to form a belt groove. Each backer block contains an annular resilient member adjacent the periphery on the surface facing the opposite backer block.



The resilient members permit the pulleys to be formed from material having wide tolerances with respect to material thickness without changing the critical dimensions on the belt groove or resulting in eccentric or wobbly pulley structures.

3,712,099

METHOD AND APPARATUS FOR FORMING RING GROOVES AND PISTON LANDS ON A STEEL PISTON, ESPECIALLY FOR INTERNAL COMBUSTION ENGINES

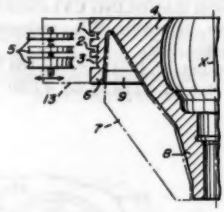
Gunter Elsbett, and Ludwig Elsbett, both of 8543 Hilpoltstein, Germany, assignors to Maschinenfabrik Angsburg-Nurnberg Aktiengesellschaft Werk Nurnberg, Nunberg, Germany

Filed Feb. 18, 1971, Ser. No. 116,465

Claims priority, application Germany, Feb. 29, 1970, P 20 07 647.5

Int. Cl. B21h *1/00, 7/18*

U.S. Cl. 72—107 **6 Claims**



A method of and apparatus for providing steel pistons with annular grooves, according to which the annular grooves are made by roll-forming the material of the piston head.

3,712,100

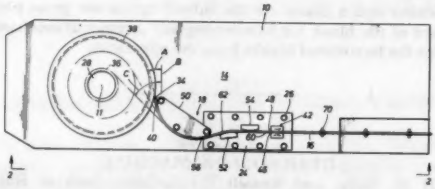
METHOD AND SYSTEM FOR LAYING A PIPELINE FROM A REEL BARGE

Joe Wayne Key, and Larry Rayner Russell, both of Houston, Tex., assignors to Flour Ocean Services, Inc., Houston, Tex.

Filed Jan. 26, 1970, Ser. No. 5,862

Int. Cl. B21d *3/02*

U.S. Cl. 72—161 **12 Claims**



A method and system for laying an underwater pipeline from a barge-mounted reel which supports a coil of elastoplastic pipe. The coil contains many layers, each formed by a plurality of variable-diameter convolutions. To make the ef-

fectiveness of the system substantially independent of the diameter of the convolution from which the pipe emerges, and to facilitate the threading through the system of the pipe span emerging from the reel, the curved emerging span is reverse-bent beyond its elastic range to a predetermined radius sufficient to prevent buckling the span. Subsequently, the reverse-bent pipe is passed through a straightener for imparting to the pipe a substantially rectilinear configuration.

3,712,101

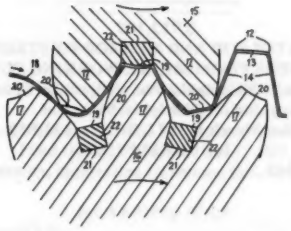
CORRUGATION-FORMING MACHINES

Colin R. Bemrose; Dennis C. Brown, and William G. Turner, Leamington Spa, England, assignors to Associated Engineering Limited, Leamington Spa, England

Filed Aug. 10, 1971, Ser. No. 170,572

Int. Cl. B21d *13/04*

U.S. Cl. 72—196 **6 Claims**



A corrugation forming machine in which a sheet of material to be corrugated is passed between a pair of rollers having meshing gear-like teeth. Resilient means is provided either at the tip of a tooth or at the root between the adjacent teeth on the other roll with which the said tooth meshes, whereby each corrugation is pressed, as it is being formed, between the resilient means on one roll and a relatively non-resilient portion of the other of the rolls.

3,712,102

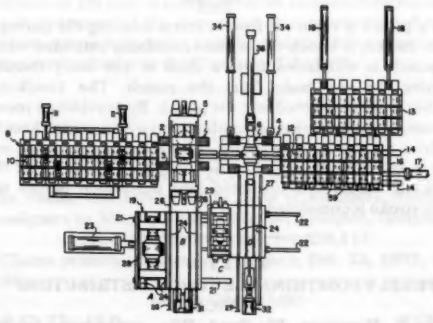
COMBINATION ROLLING MILL

Werner W. Eibe, McCandless Township, Allegheny County, Pa., assignor to Blaw-Knox Company

Division of Ser. No. 15,236, March 2, 1970, Pat. No. 3,665,746. This application March 1, 1972, Ser. No. 230,574

Int. Cl. B21b *31/08, 39/20*

U.S. Cl. 72—238 **12 Claims**



A cartridge loadable combination mill for rolling beam, structural or plate products. The combination mill includes a pair of cartridge or cartridge-like loaded mill stands, the first of which has a movable mill housing and the second of which is adaptable to being moved out of the mill line. The cartridges contain a pair of horizontal and vertical rolls that are aligned and adjusted prior to insertion into the mill stands through the mill housing windows. A four station cartridge transfer means having alternative stations simultaneously alignable with both mill stand windows is provided for supporting, positioning, and transferring work roll cartridges to the mill stands for insertion therein. A pair of movable table rolls with side guards adjustable to the maximum width of the first mill stand are movable either along the mill line or out of said line.

3,712,103

METHOD AND APPARATUS FOR THE HOT PIERCING OF METAL BILLETS

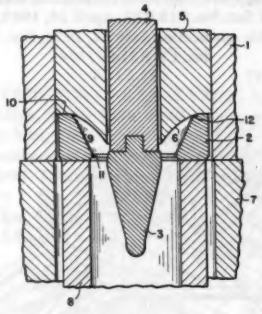
Aime Malegue, Montbard, France, assignor to Cefilac, Paris, France

Filed Nov. 16, 1970, Ser. No. 89,608

Claims priority, application France, Nov. 26, 1969, 6940768

Int. Cl. B21c *23/04*

U.S. Cl. 72—264 **5 Claims**



An improvement in the hot piercing of a previously cold drilled metal billet in which the bottom of the piercing press is equipped with a frustoconically bored ring, the aperture of which noticeably exceeds the cross-section of the desired billet bore or the expanding tool. During extrusion in an extrusion press, the section of the billet coming from the lower part of the piercing press is placed in the extrusion press adjacent to the dummy block.

3,712,104

APPARATUS FOR CLAMPING WORKPIECES IN DRAW BENCHES FOR THE LIKE

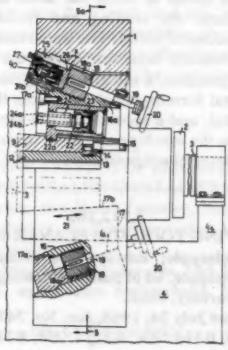
Alfons Goeke, Solingen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Filed Dec. 31, 1970, Ser. No. 103,135

Claims priority, application Germany, Jan. 22, 1970, P 20 02 709.2

Int. Cl. B21c *1/14*; B21d *43/10*

U.S. Cl. 72—290 **10 Claims**



Apparatus which clamps one or more tubular or solid rod-shaped workpieces during forcible introduction of leading

ends of such workpieces into the dies of a draw bench is mounted in a carriage which is reciprocable in the frame of the draw bench toward and away from the dies. The apparatus has pairs of wedge-like adjusting members which support wedge-like holders for work-engaging clamping elements and are movable along inclined internal guide surfaces of the carriage in response to rotation of feed screws. The inclination of guide surfaces with reference to the direction of reciprocation of the carriage exceeds the self-locking angle and the inclination of guide faces provided on the adjusting members for the holders is below the self-locking angle. A piston is employed to block the movement of one of each pair of adjusting members with reference to the carriage while the carriage performs a working stroke and while the clamping elements hold a workpiece behind the leading end which is to be forced through the die.

3,712,105

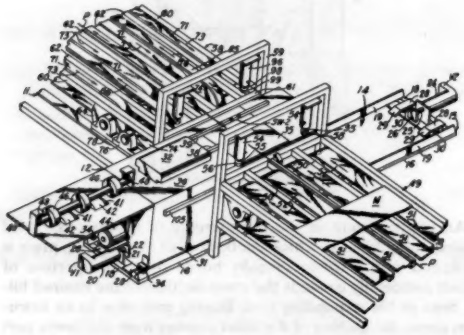
METHOD OF FORMING METAL

Robert A Harris, 1660 Clay Road, Mableton, Ga.

Division of Ser. No. 818,983, April 24, 1969, Pat. No. 3,610,017. This application July 14, 1971, Ser. No. 162,630

Int. Cl. B21d *11/04*

U.S. Cl. 72—307 **5 Claims**



A method and apparatus for forming metal wherein the method comprises the stops of moving finite lengths of metal along the prescribed path, stopping each length of metal at a predetermined position, moving a metal forming machine across the leading edge of the metal to form the same, moving the metal past the machine after it has cleared the metal, returning the machine to its initial position, reversing the movement of the metal along the path after it passes the machine to return it to a second predetermined position while moving a second piece of metal to the first predetermined position and repeating the moving of the machine across the trailing edge of the first piece of metal and leading edge of the second piece of metal to form the same and repeating the operation to form the leading and trailing ends of subsequently fed pieces of metal. The apparatus of the invention includes a first transfer table for moving the metal to the first predetermined position, a metal forming machine, means for moving the metal forming machine across the path of movement of the metal, and a second transfer table for moving the metal away from the machine and back toward the machine to the second predetermined position.

3,712,106

SHAPING TOOL FOR PLANAR SHEETS

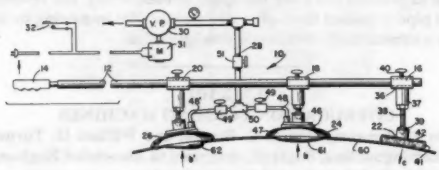
Olen Wade Holsapple; Edward Joe Holsapple, and Jerry Raymond Holsapple, all of Salem, Ill., assignors to Raymond P. Wolgast, Burkley, Mich.

Filed July 24, 1968, Ser. No. 747,178

Int. Cl. B21d *5/04*; **B21j** *13/08*; **B21b** *25/00*

U.S. Cl. 72—309 **11 Claims**

A portable tool for reshaping deformed panels comprises a vacuum cap for gripping a dented panel and force transmitting means coupled to the vacuum cup to apply an external operating force to pull the dented portion outwardly with the cup. The force transmitting means includes a rigid bar having means for applying a pulling force thereto and a coupling



means pivotally connected at one end to the vacuum cup and adjustably mounted at the opposite end to the rigid bar. The adjustable mounting may be locked at selected positions along the bar. Other features are disclosed.

3,712,107

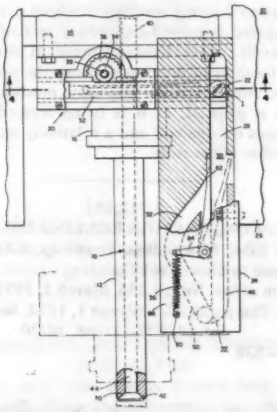
APPARATUS FOR AND METHOD OF STRIPPING CONTAINERS FROM METAL WORKING PUNCHES

F. Wm. Duhan, Philadelphia, Pa., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed March 4, 1971, Ser. No. 121,059

Int. Cl. B21d *45/00*

U.S. Cl. 72—345 **9 Claims**



As a punch is removed from a metal working die during a return stroke, a knock-out member remains extended while the punch is withdrawn from a shell or can body thereby stripping the can body from the punch. The knock-out member is then retracted into the punch. By providing a round trip camming mechanism in combination with a geared knock-out drive mechanism, the knock-out stroke for the knock-out drive is substantially equal to the height of the can and the knock-out member is retracted into the punch before the return stroke is completed.

3,712,108

FREELY POSITIONABLE FORCE DISTRIBUTING DEVICE

Wayne E. Hunnicutt, Big Bend, Wis., assignor to Applied Power Industries, Inc., Milwaukee, Wis.

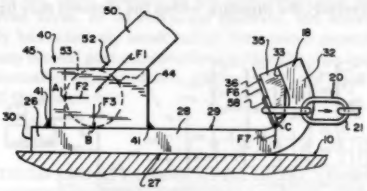
Filed Feb. 25, 1970, Ser. No. 13,966

Int. Cl. B21j *13/00*

U.S. Cl. 72—446 **6 Claims**

A freely positionable force transfer device for receiving a power strut directing a force angularly downward toward a

platform. The device is engaged by a flexible reactive member secured to the platform to maintain static equilibrium by



directing the components of the applied force into the platform and to the reactive member.

3,712,109

GRAVITY COMPENSATED ACCELERATION MEASURING APPARATUS

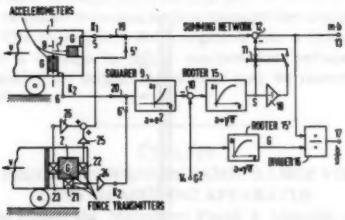
Klaus Haken, Platenstr. 15,852 Erlangen, West Germany

Filed Oct. 5, 1970, Ser. No. 77,988

Claims priority, application Germany, Oct. 7, 1969, P 19 50 452.0

Int. Cl. G01p *15/08*

U.S. Cl. 73—517 R **8 Claims**



The inertial reactive force on a proof mass being moved on an arbitrary inclined path due to the acceleration in the direction of the path is computed from two components of the bearing pressure of the suspended or supported proof mass, the one component being parallel and the other component being perpendicular to the direction of the path.

3,712,110

SAMPLE HOLDER FOR SELECTIVE THERMOANALYTICAL TESTS

Jeno Paulik, and Ferenc Paulik, both of Budapest, Hungary, assignors to Magyar Optikai Muvek, Budapest, Hungary

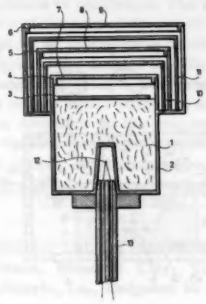
Filed Feb. 22, 1972, Ser. No. 228,117

Claims priority, application Hungary, Feb. 22, 1972, MA-2196

Int. Cl. G01n *25/00*

U.S. Cl. 73—15 B **9 Claims**

A sample holder for selective thermoanalytical analysis of specimens, comprises a receptacle for the specimen and cover means for the receptacle. The cover means provides a labyrinthine path for escape of gases from the sample. This labyrinthine path can be provided by concentric cylindrical elements which permit the gas to escape past alternately opposite edges thereof, or a helical groove in the outer cylindrical periphery of the cover means that defines the labyrinthine



path. A thermocouple for continuously detecting the temperature of the sample is disposed in a central recess in the bottom of the vessel.

3,712,111

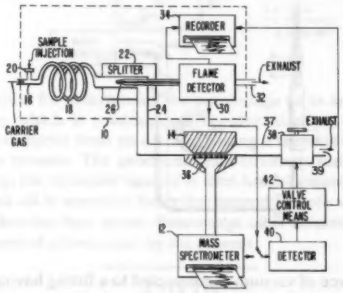
FLOW CONTROL FOR GAS ANALYZING APPARATUS

Peter M. Llewellyn, Menlo Park, Calif., assignor to Vanan Associates, Palo Alto, Calif.

Continuation-in-part of Ser. No. 551,756, Dec. 6, 1965, Pat. No. 3,455,092. This application July 10, 1968, Ser. No. 743,852

Int. Cl. B01d *59/44*; **G01n** *31/08*

U.S. Cl. 73—23.1 **8 Claims**



A gas chromatograph-mass spectrometer system including means for varying the amount of throughput from chromatograph to spectrometer without physically altering the flow path therebetween. A valve means is inserted in the effluent flow path of the chromatograph downstream of the spectrometer inlet system so that the exhaust port flow path may be constricted to unbalance the pressure differentials in the chromatograph detector flow path and the main flow path downstream of the splitter thus enabling the effective split ratio to be selectively varied without affecting the geometry of the flow stream connecting the chromatograph and spectrometer.

3,712,112

DEVICE FOR THE TESTING OF SEAMS OF FOIL OR SHEET SEALED CONTAINERS

Karl Widmer, Zurich, and Horst Zumsteg, Neuhasen, both of Switzerland, assignors to Schweizerische Aluminum AG, Chippis, Switzerland

Filed May 17, 1971, Ser. No. 144,166

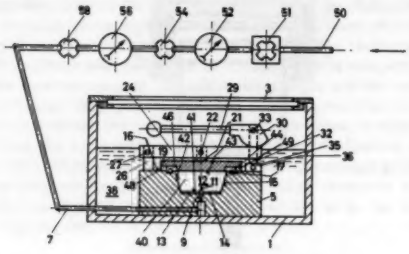
Claims priority, application Switzerland, May 29, 1970, 8057/70

Int. Cl. G01m *3/02*

U.S. Cl. 73—37 **5 Claims**

A device for the testing of seams of lightweight containers sealed with foil or sheet, the device being especially adapted

for testing of the seams. The device comprises a supporting means to support the container except for the seam zone and



means to introduce a pressure medium into the container and to increase the pressure thereof until either the seam bursts or a pre-set test pressure is reached.

3,712,113

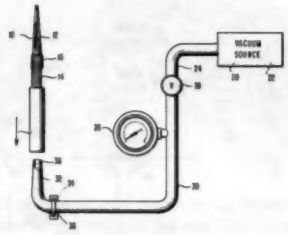
METHOD AND APPARATUS FOR GRADING DOUBLE REEDS FOR MUSICAL INSTRUMENTS

William A. Roscoe, 162 Halpine Road, Rockville, Md.

Filed March 23, 1971, Ser. No. 127,295

Int. Cl. G01m *3/02*

U.S. Cl. 73—37 **5 Claims**



The source of vacuum is connected to a fitting having a configuration complementary to the internal dimensions of a musical instrument mouthpiece having a double reed secured thereto. Suitable gauge and regulating means may be provided in the vacuum line and upon gradually lowering the mouthpiece over the fitting the reed will begin to vibrate and cease vibrating at specific readings on the gauge. Likewise, upon lifting the mouthpiece off the fitting, the double reed will again begin to vibrate and cease vibrating at specific readings on the gauge. The readings on the gauge are indicative of the vacuum range over which the double reed will vibrate. Thus, it is possible to grade each reed as to hardness.

3,712,114

DUST BAG QUALITY TESTING SYSTEM

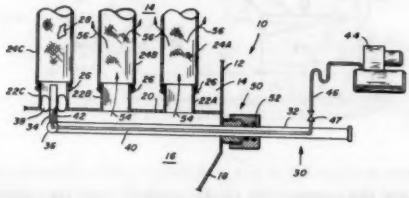
Jack S. Osborn, 4041 South Richmond, Tulsa, Okla.

Filed May 3, 1971, Ser. No. 139,723

Int. Cl. G01m *3/28;* **G01n** *15/08;* **B01d** *35/14*

U.S. Cl. 73—38 **15 Claims**

This invention is concerned with the testing, while in use, of the plurality of filtering elements in an air filtration system. The system involves an air inlet chamber separated from an air outlet chamber by a tube sheet. Filtration elements are clamped over these tubes so that air passes up the tubes into the elements, or bags, through the walls of the elements and into the outlet air chamber; the dust remaining inside the bags. To test the condition of each bag separately, a probe tube is selectively positioned through the wall of the air inlet chamber beneath any desired tube and filter element. The annular space between tip and tube is sealed off by means of an inflatable collar. Low pressure air is injected into the isolated element at a constant rate. The pressure of the air within the element is measured and is indicative of the condition of the element. Conversely the pressure within the element may be con-



stant and the flow rate measured as an indicator of the filter condition. If an element has an opening through the wall, air through that element must be closed off. This is done by positioning in the tube a bladder, inflating it with pressurized air through a needle passing through the wall of the bladder, and withdrawing the needle.

3,712,115

PIPE TESTING APPARATUS

Darwin A. Miller, Houma, La., assignor to Gerald F. Lofaso, Houma, La.

Filed Oct. 9, 1970, Ser. No. 79,397

Int. Cl. G01m *3/28;* **E21b** *33/124*

U.S. Cl. 73—49.1 **10 Claims**

Upper and lower axially spaced, radially expansible seals are secured to each other by an elongate spacer bar to form a pipe testing assembly. The assembly is positioned within the pipe to be tested and fluid pressure is employed to expand the upper and lower seals radially into sealing engagement with the surrounding pipe. Pressurized test fluid is introduced into the pipe within the enclosed area between the spaced seals to test the pipe for leaks. The lower seal includes a mandrel over which a preshaped cup seal is slidably disposed above a plurality of annular compression seals. The test fluid moves the cup seal downwardly which compresses the compression seals and causes them to move radially outwardly into sealing engagement with the surrounding pipe. Fluid containing chambers are formed between the expanded cup seal and compression seals to provide a back pressure which prevents high pressure collapse of the cup seal. If desired, a second seal having the same construction as the lower seal may be inverted and employed as the upper seal in the testing assembly.

In a modified form, the preshaped cup seal is replaced by a normally retracted, annular working seal mounted on the mandrel which in turn is threadedly coupled with the lower

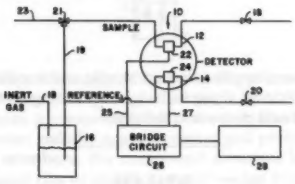
end of the spacer bar. A friction drag holds the mandrel stationary and rotation of the spacer bar causes the upper end of the working seal to be moved outwardly by a cone spreader carried on the spacer bar whereupon the working seal functions in the same manner as the preformed cup seal of the preferred form. In its retracted position, the lower seal assembly has relatively small radial dimensions permitting it to be freely moved past constrictions within the pipe being tested and thereafter expanded into an operative cup shape by rotation of the spacer bar.

3,712,116

METHOD AND APPARATUS FOR DETECTING LIQUID COMPOSITIONS BY THERMAL CONDUCTIVITY

Marshall L. Andre, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 25, 1970, Ser. No. 92,790
Int. Cl. G01n *25/18*
U.S. Cl. 73—53 **5 Claims**



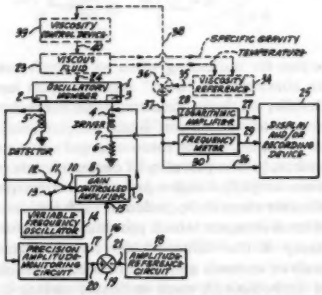
Liquid/liquid interfaces and changes in bulk-liquid composition may be detected by changes in thermal conductivity. A pair of thermistors are located, one in the reference side and the other in the sample side of a cell. A reference solvent is caused to flow through the reference side of the cell while the liquid to be tested is caused to flow through the sample side of the cell. The thermistors are integrated into a bridge circuit such that a change in liquid composition unbalances the bridge causing an output signal that may be recorded on a strip chart.

3,712,117

HIGH PRECISION WIDE DYNAMIC RANGE VISCOUS LOSS MEASURING APPARATUS

J. Vincent Fitzgerald, Metuchen; Frank J. Matusik, and Hans R. Oppliger, both of Piscataway, all of N.J., assignors to National Metal and Refining Company, Inc., Edison, N.J.

Filed Jan. 12, 1971, Ser. No. 105,833
Int. Cl. G01n *11/16*
U.S. Cl. 73—59 **13 Claims**



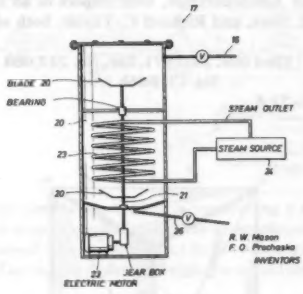
A viscosity measuring system especially useful in pollution and chemical process control applications. A variable gain amplifier drives a magnetic coil which causes a torsion member to oscillate. The amplitude of the oscillations is sensed by a transducer, and converted to a DC voltage by an amplitude monitoring circuit. The DC voltage, which represents the instantaneous amplitude of mechanical oscillation, is compared to a reference DC voltage which represents the desired amplitude of oscillation. The resulting error signal is utilized to control the gain of the amplifier in such a manner that the amplitude of mechanical oscillation is maintained constant and equal to the desired amplitude. The viscosity of the fluid in which the torsion member is immersed is obtained by providing an output signal which is a measure of the power provided by the amplifier to the magnetic coil in order to maintain the desired constant amplitude of oscillation. Preferably, the output signal is obtained from the voltage developed across a resistor in series with the magnetic coil.

3,712,118

METHOD OF OIL CUT DETERMINATION

Robert W. Mason, Missouri City, Tex., and Frank O. Prochaska, Metarie, La., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 26, 1971, Ser. No. 119,277
Int. Cl. G01n *33/26*
U.S. Cl. 73—61.1 R **11 Claims**



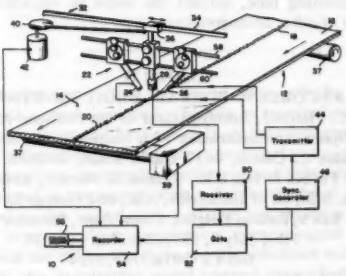
A method for determining the percentage oil in an oil-water emulsion which is predominately water, such as in a fluid stream produced from an oil field during a thermal secondary recovery process. The produced fluid stream is sampled continuously, the collected sample is then homogenized and sampled, and oil is removed from the second sample with an oil solvent heavier than water. Percentage oil is determined from the volume of oil removed by the solvent.

3,712,119

MATERIAL TESTER

Benjamin T. Cross, Jamestown, Colo., and Gerald J. Posakony, Boulder, Colo., assignors to Automation Industries, Inc., El Segundo, Calif.

Continuation of Ser. No. 644,962, June 9, 1967, abandoned, and a continuation-in-part of Ser. No. 792,217, Jan. 13, 1969, which is a continuation of Ser. No. 521,264, Jan. 18, 1966, abandoned. This application Jan. 30, 1970, Ser. No. 7,340
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.7 **7 Claims**



This invention relates to ultrasonic nondestructive testing wherein ultrasonic energy is transmitted into a workpiece and

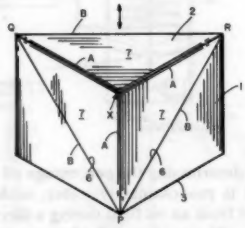
the various characteristics of the workpiece, such as the presence or absence of defects, are determined by receiving ultrasonic energy reradiated from the workpiece. The system includes one or more transmitting transducers positioned to transmit ultrasonic energy onto the surface of the workpiece at an oblique angle whereby the ultrasonic energy is converted into a shear mode and propagates laterally through the workpiece into an inspection region. If there are any discontinuities within the inspection region at least a portion of the incident shear waves are reradiated from the discontinuity. A receiving transducer is disposed laterally from the transmitting transducer and substantially normal to the surface of the workpiece for receiving the reradiated energy. In addition, several novel forms of scanning are provided for inspecting large areas of the workpiece and producing a printed record of the characteristics of the workpiece.

3,712,120

MULTI AXES VIBRATION FIXTURES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Clifton R. Sims, and Richard C. Taylor, both of Huntsville, Ala.

Filed Dec. 28, 1971, Ser. No. 213,004
Int. Cl. B06b *3/00*
U.S. Cl. 73—71.6 **8 Claims**



The apparatus includes a shaker platform fixture having a mounting face upon which is supported a movable specimen mounting fixture. The specimen mounting fixture is pivotally movable relative to an axis perpendicular to the plane of the mounting face of the platform fixture and holds a specimen to be vibrated along its orthogonal axes. The mounting face of the platform fixture is provided with the necessary angle of incline relative to the plane of vibration, and the specimen mounting fixture is provided with mounting faces having the necessary angle of incline relative to the mounting faces of the platform fixture, such that turning of the specimen mounting fixture about its pivotal axis will expose the mounted specimen to vibration along each of its major orthogonal axes. A shaker platform is provided of a configuration having a mounting face of such angular incline to the plane of vibration so that the specimen to be vibrated may be attached directly to this face, and, in turning of the specimen along an axis perpendicular to said mounting face, subject the same to vibration along a number of other orthogonal axes.

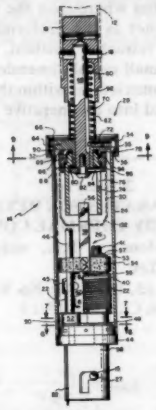
3,712,121

SELF-RECORDING PORTABLE SOIL PENETROMETER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Nicholas C. Costes, 4017 Garth Road; Rolland G. Sturm, 1320 Forbes Drive, S.E.; Roland H. Norton, 2508 Lancelot Drive, S.E., all of Huntsville, Ala., and George E. Campbell, P. O. Box 9, Balboa Heights, Canal Zone, Panama

Filed July 9, 1971, Ser. No. 161,028
Int. Cl. G01n *3/14, 3/24*
U.S. Cl. 73—84 **4 Claims**

A lightweight,, portable penetrometer for testing soil characteristics, which penetrometer is composed of a handle, data recording, and probe components detachably joined together. The data recording component having an easily removed recording drum which rotates according to the



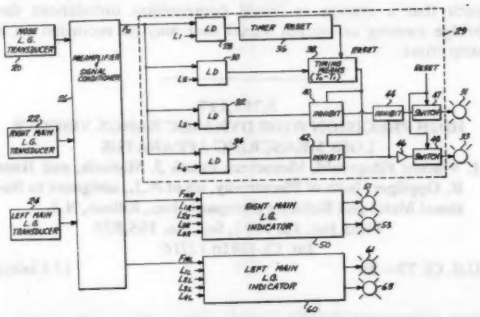
downward force applied on said handle and a stylus means for marking said drum along its height according to the penetration depth of said probe into the soil.

3,712,122

AIRCRAFT HARD LANDING INDICATOR

Carl L. Harris, Kirland, Wash.; Leighton C. Rama, Bellevue, Wash., and Dallas V. Soward, Seattle, Wash., assignors to Electro Development Corporation, Lynnwood, Wash.

Filed Feb. 8, 1971, Ser. No. 113,121
Int. Cl. G01l *3/00*
U.S. Cl. 73—88.5 R **10 Claims**

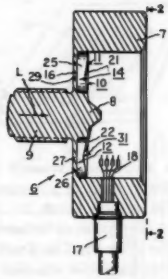


An apparatus for indicating when an aircraft has been subjected to an abnormal or "hard" impulse upon landing comprises a plurality of force sensors, each force sensor being disposed to provide an output signal proportional to the instantaneous ground contact force exerted upon one landing gear of the aircraft. The plurality of output signals provided by the sensors are amplified and supplied to a corresponding plurality of indicator circuits. Included in each indicator circuit is at least one level detector which provides an output to light an indicator lamp if the value of the output signal supplied thereto equals or exceeds a predetermined threshold value. In a preferred embodiment, each indicator circuit comprises a plurality of level detectors responsive to different threshold values. If a second, greater threshold value is exceeded during a predetermined time interval following traversal of a first, lesser threshold value, an output is provided by the indicator circuit to light the indicator lamp. The force threshold values and time interval which comprise an abnormal landing impulse are arrived at by structural analysis of the entire aircraft.

3,712,123
COMPOUND-PLATE STRAIN GAGE TRANSDUCER

Eric Laimins, Belmont, Mass., assignor to BLH Electronics, Inc., Waltham, Mass.

Filed Jan. 7, 1971, Ser. No. 104,623
Int. Cl. G01l 1/22
U.S. Cl. 73—141 A 3 Claims

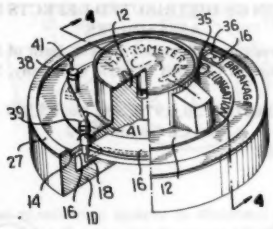


A low-profile strain-gage transducer capable of operating accurately over relatively low force ranges includes as a main sensing element a compound flat plate and rib structure extending between radially spaced central and peripheral load-transmitting members, the compound structure having relatively stiff gaged ribs of doubly tapered wedge form in a symmetrical annular array wherein the ribs are angularly separated by relatively low-stiffness web or plate portions.

3,712,124
COMPACT ANALYZER FOR HAIR-LIKE FIBERS

George J. Lutz, 4721 North Washington Boulevard, Arlington, Va.

Filed Oct. 1, 1971, Ser. No. 185,576
Int. Cl. G01n 3/14
U.S. Cl. 73—95 11 Claims

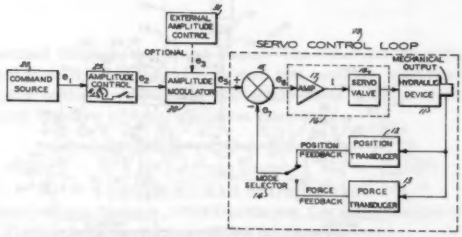


A device for testing the tensile strength and elongation capacity of hair and hair-like fibers includes an actuable rotator and a tension ring concentrically disposed and mounted for independent rotation. The tension ring is biased by a calibrated spring to a neutral angular position relative to a hand-held body member. Binding posts secured to the rotator and tension ring, respectively, secure respective ends of a hair being measured, whereby rotation of the rotator in opposition to the spring bias on the tension ring exerts a tension force on the tension ring through the measured hair. A scale member is rotatably mounted below the tension ring and actuator and includes a shoulder which is engaged by a projection from the tension ring, whereby the scale member rotates with the tension ring when the latter is rotated against the spring bias. The scale member includes an elongation scale, calibrated in percent elongation of the measured hair, which is read through an elongation indicator aperture defined through the rotator. The scale member additionally includes a breakage point scale, calibrated in tension force, which is read through a breakage point indicator aperture defined through the tension ring. Rotation of the actuable rotator relative to the tension ring is a measure of elongation of the hair and is measured on the elongation scale. The tension force which causes breakage of the hair is read on the breakage point scale through the breakage point indicator aperture after the tension ring is restored to its neutral position by the bias spring.

3,712,125
LOAD SIMULATION SYSTEM

Walter E. Meyer, Ferndale, Mich., assignor to Koehring Company, Milwaukee, Wis.

Filed Sept. 25, 1970, Ser. No. 75,493
Int. Cl. G01n 3/10
U.S. Cl. 73—90 10 Claims

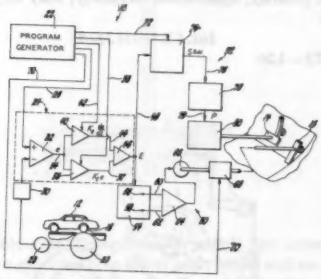


A servo load simulation system incorporating a servo control feed-back loop in combination with an amplitude multiplier and an external amplitude control to provide a gradual rate of increase of an analog command signal to an actuator.

3,712,126
VEHICLE SPEED CONTROLLER

Robert Campbell, Roseville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1970, Ser. No. 91,892
Int. Cl. B60k 31/00
U.S. Cl. 73—117 4 Claims



Apparatus for controlling the speed of a vehicle in accordance with a predetermined schedule by manipulating the vehicle's accelerator and brake pedals. A program generator generates a reference signal that is proportional to the desired speed of the vehicle during the predetermined schedule. The reference signal is compared with a feedback signal that is proportional to the actual speed of the vehicle by a signal generating network which generates a control signal in accordance with the difference between the reference and feedback signals. An accelerator pedal control network that includes a DC motor which is driven by uniform high voltage pulses manipulates the accelerator pedal in accordance with

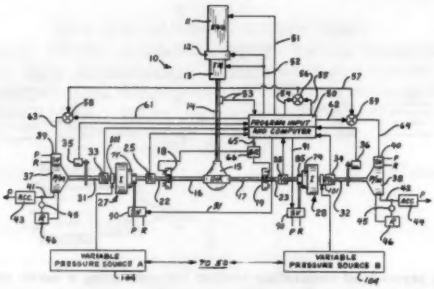
the control signal. A brake pedal control network that includes a pneumatic actuator and an electrical to pressure transducer manipulates the brake pedal in accordance with the control signal. The operativeness of the brake pedal control network and the accelerator pedal control network and the amplification of the signal generating network are controlled by the program generator in accordance with the predetermined schedule.

3,712,127

DRIVE TRAIN TEST STAND

Niel R. Petersen, Hopkins, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed Aug. 11, 1970, Ser. No. 62,856
Int. Cl. G01m *13/02*
U.S. Cl. 73—118 **12 Claims**



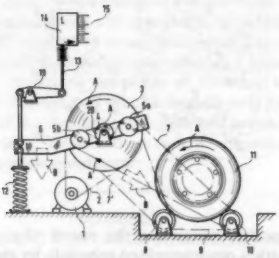
A test stand for testing vehicle drive trains which includes means for loading the drive train with dynamic inertial loads that can be superimposed on static or usual torque levels. The inertial load on the drive train can be used to simulate acceleration and braking loads.

3,712,128

TEST STAND FOR VEHICLE BRAKES

Osmond Beissbarth, Sulzbacherstrasse 15, 8 Munich 23, Germany

Filed May 21, 1971, Ser. No. 145,638
Claims priority, application Germany, May 25, 1970, P 20 25 549.6
Int. Cl. G01l *5/28*
U.S. Cl. 73—126 **6 Claims**



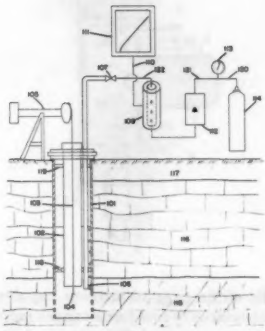
The right and left front or rear wheels of a vehicle are driven by a common motor via a common driving shaft. Two measuring beams, one for the right and one for the left wheel, are mounted on the shaft so as to be freely rotatable relative to the shaft. Each vehicle wheel is driven from the shaft by a chain or belt surrounding guide wheels mounted on each beam. The braking forces exerted on each wheel are separately detected by means of gauges connected to each measuring beam.

3,712,129

SIMPLIFIED WELLBORE PRESSURE TESTING APPARATUS

Vaughan W. Rhoades, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed June 2, 1970, Ser. No. 42,832
Int. Cl. E21b *47/06*
U.S. Cl. 73—151 **6 Claims**



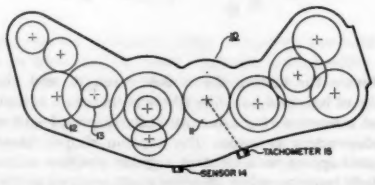
A length of microtubing is strung from the surface to the bottom of a well string during well completion and sealed at the surface by a valve. Pressure is recorded as desired by regulation of a pressurized gas, metered by a microflow mechanism, into the microtubing so that a predetermined flow of gas is continuously bubbled from the exit of the microtubing at the bottom of the well. A pressure gauge may be attached to the microtubing at the surface so as to measure the shut-in or flowing pressure of the well. The injected gas is of a known density so that a correction for the flowing head can be made to accurately determine the bottomhole pressure.

3,712,130

DETECTION OF DISTRIBUTED DEFECTS IN GEAR ASSEMBLIES

Bjorn Weichbrodt, and Bernard Darrel, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,331
Int. Cl. G01m *13/02*
U.S. Cl. 73—162 **5 Claims**



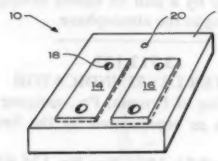
A distributed defect in one of a pair of meshing gears produces a modulation in amplitude of the component of the vibration signal which has the same repetition rate as the meshing frequency of the gears. The modulation has a frequency corresponding to the period of rotation of the gear with the distributed effect or a submultiple thereof. Detection of the modulation provides an indication of the existence, character and extent of the defect.

3,712,131

HEAT FLUX INDICATOR

Warren K. Smith, 100 Coral Sea Circle, China Lake, Calif.

Filed Feb. 22, 1971, Ser. No. 117,473
Int. Cl. G01k 17/00
U.S. Cl. 73—190 H 6 Claims



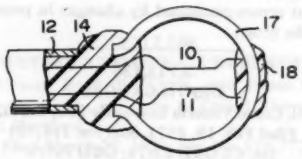
An inexpensive passive heat flux sensor and recording device for measurements in fires or other hot environments comprising a pair of small spring steel strips of different thicknesses, heat treated to maximum hardness. The strips are fastened together back-to-back with asbestos paper insulation between them, or they are mounted side-by-side on a piece of asbestos millboard. After immersion in a fire the two steel pieces are tested for Rockwell C hardness, which is referred to a set of charts prepared with the aid of a computer program. The charts give the average heat flux and the time from beginning of exposure to approximately the maximum temperature of the steel pieces. It is also possible to calculate the approximate flame temperature from the data.

3,712,132

DROPLET MONITORING PROBE

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of; James R. Baughman, 7110 Pomelo Drive, Canoga Park, Calif., and Paul C. Thys, 13208 Goleta, Pacoima, Calif.

Filed Sept. 23, 1970, Ser. No. 74,759
Int. Cl. G01f 3/00
U.S. Cl. 73—194 E 7 Claims



A droplet monitoring system is disclosed for analysis of mixed-phase fluid flow in development of gas turbines. The system uses a probe comprising two electrical wires spaced a known distance apart and connected at one end to means for establishing a DC potential between the wires. A drop in the fluid stream momentarily contacting both wires simultaneously causes an electrical signal which is amplified, detected and counted.

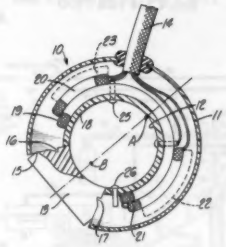
3,712,133

FLOWMETER PROBE

Allan S. Westersten, Los Angeles County, Calif., assignor to Statham Instruments, Inc., Oxnard, Calif.

Filed July 24, 1970, Ser. No. 57,903
Int. Cl. G01p 5/08
U.S. Cl. 73—194 EM 3 Claims

An insulative hollow cylinder, whose internal bore is slightly larger than the external dimensions of the blood vessel on which it is to be mounted, has a longitudinal portion removed to form an access opening. A first magnetizing coil is formed about the exterior of the insulative cylinder and is looped to extend circumferentially about the cylinder at substantially 180° thereof. At each side of the first magnetizing coil there is provided at least one auxiliary winding whose field axis is



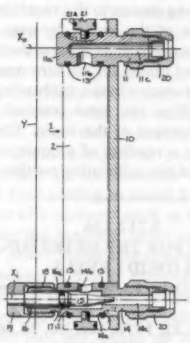
directed through the blood vessel. The resultant magnetic field from the first magnetizing coil and auxiliary windings is highly uniform throughout the entire cross section of the blood vessel on which the probe is mounted.

3,712,134

VARIABLE AREA FLOWMETER

Hans Juergen Dettmer, 3400 Goettingen, Germany, assignor to Fischer & Porter Company, Warminster, Pa.

Filed March 9, 1971, Ser. No. 122,378
Claims priority, application Germany, April 6, 1970, P 70 12 517.6; April 6, 1970, P 20 16 329.5
Int. Cl. G01f 1/00
U.S. Cl. 73—209 6 Claims

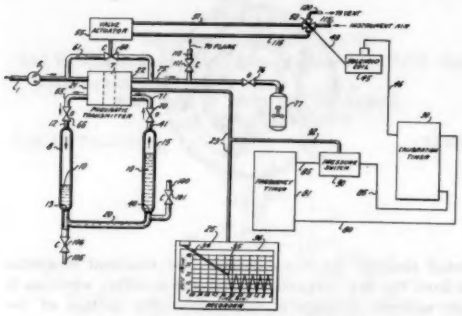


A variable-area flowmeter in which the meter tube is removably supported on a lower inlet fitting and an upper outlet fitting projecting forwardly from a mounting plate. The meter tube is provided with lateral openings adjacent the lower and upper ends thereof, which openings register respectively with the inlet and outlet fittings and are dimensioned to snugly accommodate these fittings. Extending longitudinally within the tube between the lateral openings is a tapered bore having a float therein. The inlet end of the bore is aligned with a port in the inlet fitting leading to an inlet passage, whereas the outlet end of the bore is aligned with a port in the outlet fitting leading to an outlet passage, whereby fluid introduced through the inlet fitting and passing through the bore into the outlet fitting causes the float to rise to a level determined by fluid flow rate. The meter tube may be removed simply by sliding it off the fittings, which are provided with O-rings sealably to engage the walls of the lateral openings.

3,712,135
CALIBRATING MEDIUM DISPLACEMENT FLOW RATE CALIBRATOR

E. T. Reves, Odessa, Tex., assignor to Dart Industries, Inc., Los Angeles, Calif.

Filed Oct. 29, 1971, Ser. No. 193,927
Int. Cl. F16h 7/00
U.S. Cl. 73—219 12 Claims



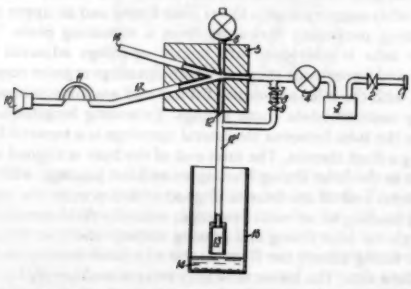
A flow rate calibration apparatus and method therefor is designed to accurately calibrate the flow rate of very small streams that are difficult and potentially dangerous to handle. The apparatus is particularly adaptable to measuring the flow rates of relatively high pressure streams.

The apparatus comprises a receptacle for a calibrating medium, e.g., mercury, which receptacle contains a high pressure leg with an inlet and a low pressure leg with an outlet and a conduit interconnecting the legs for maintaining them in fluid communication; sensing means for sensing differential pressure; conduit means for flow of fluid from the pump through the sensing means and the inlet to the high pressure leg and for flow of the fluid from the low pressure leg through the outlet and the sensing means to the receiving vessel during the calibrating portion of the cycle; by-pass means for by-passing the fluid around the first means during the by-pass portion of the cycle; and timing means for controlling the time interval the apparatus remains in the calibrating portion of the cycle and for controlling the time interval the apparatus remains in a by-pass portion of the cycle. The differential is translated directly into a reading of amount of fluid pumped over the time interval of the calibrating portion of the cycle.

3,712,136
ARRANGEMENT FOR THE DETERMINATION OF LIQUID LEVELS

Per Reidar Monsen, Oslo 1, Norway, assignor to Navalco A/S

Filed Sept. 22, 1970, Ser. No. 74,262
Int. Cl. G01f 23/16
U.S. Cl. 73—290 3 Claims

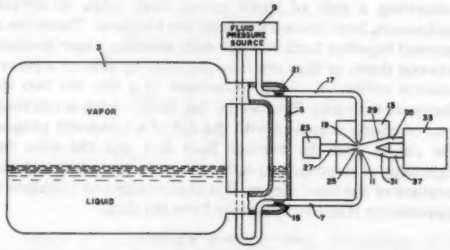


A fluidic level sensor in which a stream of energy fluid is alternatively diverted between two discharge channels by a control channel. One of the discharge channels is connected to an indicator, and the control channel is connected to a hollow probe which is adapted to have its free end closed by the surface of the fluid material being sensed. A branch channel is provided between the supply line of the fluid of the device and the control channel to permit the use of the supplied energy fluid to divert the stream into a selected discharge channel, the line is controlled by a pair of valves having a small hole therebetween opening to the atmosphere.

3,712,137
WATER LEVEL INDICATOR

Pierce H. Zavod, King of Prussia, Pa., assignor to the United States of America as represented by the Secretary of the Navy

Filed April 23, 1971, Ser. No. 136,920
Int. Cl. G01f 23/14, 23/22
U.S. Cl. 73—295 8 Claims

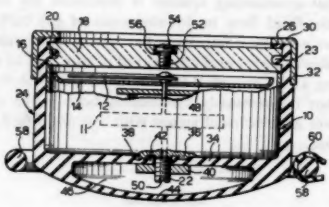


Subject disclosure relates to novel and improved apparatus for continuously indicating the liquid level of a material in a heated pressurized vessel. The improved apparatus includes a tube, a portion of which passes through the liquid phase of the material, a pressurized fluid source connected to one end of the tube and means including a fluidic amplifier and a pressure drop transmitter connected to the other end of the tube for converting variations in pressure in the tube into a measure of liquid level in the vessel. A second tube, a portion of which passes through the vapor phase of the material is also connected between the pressurized fluid source and the fluidic amplifier and pressure drop transmitter to null liquid level measurement errors produced by changes in pressure of the material in the vessel.

3,712,138
DEPTH GAUGES

Carlo Alinari, Corso Vittorio Emanuele 200, Turin, Italy

Filed Feb. 19, 1971, Ser. No. 116,791
Int. Cl. G01f 23/14; G01l 19/14
U.S. Cl. 73—300 6 Claims



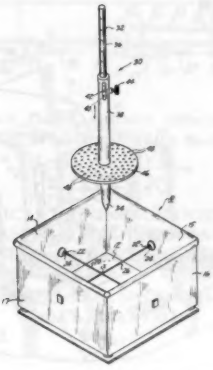
A depth gauge is of the type having a cup-like body containing a Bourdon tube, a nipple on the body communicating with the interior of the tube. The body is enclosed in a resilient casing with the nipple passing sealingly through a wall in the casing. That wall is covered by a flexible membrane forming part of the casing, the space between the sall and membrane being filled with an inert liquid which also fills the nipple and bourdon tube. The surrounding pressure, acting on the membrane and through it on the inert liquid, actuates the gauge.

3,712,139

VOLUME MEASURING CONTAINER

John P. Harvey, Grand Haven, Mich., assignor to Harvey Harvesters, Inc., Sprink Lake and Grand Haven, Mich.

Filed July 13, 1970, Ser. No. 54,421
Int. Cl. G01f 19/00
U.S. Cl. 73—428 4 Claims



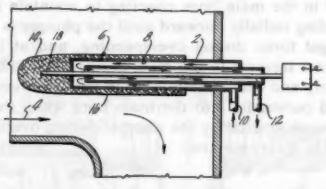
A container which is adapted to be filled with fruit, particularly berries, cherries, grapes or the like smaller fruit, placed in the container immediately after harvesting and immersed in water to preserve their freshness; the container is provided with tension cables attached to opposite side walls of the container and crossing each other at the center of the container to reinforce the side walls of the container which are initially flexed to bulge outwardly before the cables are applied; the intersection of the tensioning cables provides an accurate center locating means for a probe adapted to be inserted into the container to measure the volume of the product retained in the container.

3,712,140

WET BULB TEMPERATURE SENSOR

Albert P. Grasso, Rockville, Conn., and James K. Stedman, Glastonbury, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed March 29, 1971, Ser. No. 128,772
Int. Cl. G01n 25/62
U.S. Cl. 73—338 5 Claims



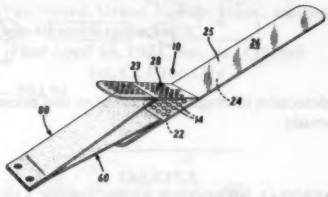
A temperature sensor for sensing the wet bulb temperature of a gas stream containing vapor is provided by the combination of a housing having a condenser thereon, including cooling means, a wick disposed in the gas stream in fluid connection with the condensing means, and a temperature sensor having its sensing element disposed in the wick.

3,712,141

DISPOSABLE THERMOMETER CONSTRUCTION

Desh D. Chadha, Caldwell; Babu B. Patel, Parsippany, and Charles G. Pickett, Andover, all of N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed Oct. 14, 1971, Ser. No. 189,176
Int. Cl. G01k 11/08, 11/12
U.S. Cl. 73—356 27 Claims



A thermometer having a thermally sensitive substance deposited on a thermally conductive sheet, e.g., aluminum, and an overlying transparent film carrying indicator means which are superpositionably registerable with the thermally responsive substance for communicating therewith to denote specified temperatures upon change of state of the substance is provided with readily removable shield components associated, respectively with the thermally responsive substance, and the indicator means to protect the thermally responsive substance and indicator means from any adverse environmental conditions which would prohibit, alter or otherwise inhibit proper functioning of the thermometer when actually required for use. The shield component associated with the thermally responsive substance, is of substantially vapor impervious character and comprises a material which is non-reactive with the thermally responsive substance heat sealable to the thermally conductive sheet and so sealed in face-to-face contact to the thermally conductive sheet in covering position over the thermally responsive substance deposits. Such shield component preferably is a two-layer laminate comprised of an ionomer layer selected for its amenability for heat sealing to metal foil, and a vapor-barrier reinforcing layer of a material such as aluminum, polyester or nylon overlaying the ionomer layer and in intimate contact therewith. The other shield component, i.e., associated with the indicator means, is readily removably adhesively secured to the transparent film. Both shield components can be peelably removed from the thermometer by pulling action applied digitally to pull tab means on the shield components. Concurrent with the peeling of the shield components from the transparent film and thermally conductive sheet when rendering to thermometer operative for use, the former is pressed against the thermally conductive sheet to position the indicator means in proper overlying communicating registration with the temperature responsive substance.

3,712,142

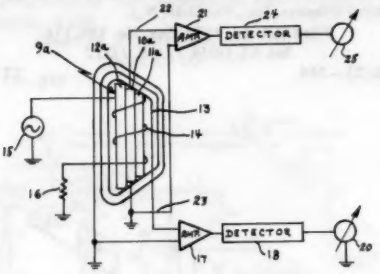
MAGNETIC AND PRESSURE TRANSDUCER

Frank F. Stucki, Portola Valley, Calif., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Nov. 17, 1971, Ser. No. 199,488
Int. Cl. G01l 9/06; G01d 7/04
U.S. Cl. 73—389 2 Claims

A combined magnetometer/pressure transducer in which a

pressure transducer structure is wrapped into two perpendicular windings of a magnetometer to provide a multi-sensor head



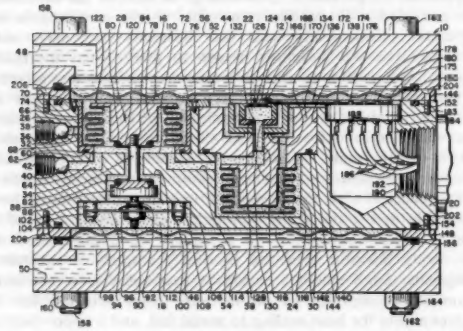
allowing detection of magnetic anomalies and pressure signals simultaneously.

3,712,143

DIFFERENTIAL PRESSURE RESPONSIVE APPARATUS

John A. Weaver, Philadelphia; Carl Raymond Brandt, Fort Washington, and Lester R. Leidy, Jr., Oreland, all of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 21, 1971, Ser. No. 210,365
Int. Cl. G01l 7/08, 9/04
U.S. Cl. 73—407 R **11 Claims**



A unique construction for improving the compactness, accuracy, stability, reliability and sensitivity of fluid filled meters employed to transduce a differential fluid pressure measurement into an electrical signal before, during and after the existence of an abnormal overload condition on the high or low fluid pressure side of the meter by employing:

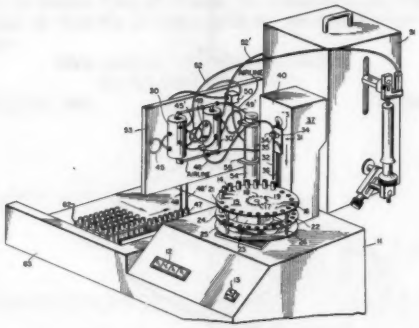
1. A wafer supported on a stationary body portion of the meter which is made of a single crystal silicon material having a diffused - fully active resistive bridge pattern thereon to sense the differential pressure that is applied to the wafer.
2. A motionless electrical connection between the diffused - fully active, resistive bridge on the wafer and a power transmitting current outside said meter.
3. A flexible compliance bellows connected in compact parallel relationship with a bellows actuated overload valve for (*a*) preventing an indicator measuring the magnitude of the differential pressure under measurement from erroneously indicating that the measurement is at an on scale valve when in fact it is at a dangerous over scale valve and retaining the differential pressure acting sensor during a high or low pressure overload condition within a desired pre-selected pressure range so that the wafer and resistive bridge cannot be impaired as an overload fluid pressure is applied to the meter.

3,712,144

AUTOMATED SYSTEM FOR PERFORMING SAMPLE MEASUREMENT, DILUTIONS AND PHOTOMETRIC MEASUREMENTS

Norbert R. Kuzel, Indianapolis, Ind., and Frederick W. Kavanagh, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 801,369, Feb. 24, 1969, Pat. No. 3,609,040. This application March 10, 1971, Ser. No. 122,843
Int. Cl. G01n 1/10
U.S. Cl. 73—421 R **8 Claims**



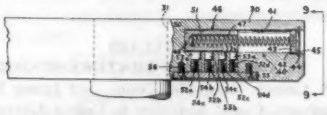
An automatic diluter and photometric reader adapted for use in the turbidimetric microbiological assays of antibiotics, vitamins, and the like, as well as in various other analytical assays.

3,712,145

OVERSPEED DETECTOR FOR ROTARY MEMBER

Tore Hartmann-Hansen, Wellsville, N.Y., assignor to Worthington Turbine International Inc., Wellsville, N.Y.

Filed Dec. 8, 1971, Ser. No. 206,020
Int. Cl. G01p 3/16
U.S. Cl. 73—491 **6 Claims**



An overspeed detector to be utilized on a rotary device for absolutely determining when overspeeding has occurred includes means providing a housing connected to and rotatable with the rotary member and having a main bore radially disposed with respect to the center or axial line of the rotary member, a plunger slidable in said main bore and a resilient member in the main bore coacting to maintain said plunger from sliding radially outward until the plunger is acted on by centrifugal force during overspeeding, and at least one or more bores traverse to the main bore so that indicator members freely and slidably mounted in the transverse bores can be urged outwardly into the main bore when the transverse bores are uncovered by the plunger during overspeed conditions of the rotary member.

3,712,146

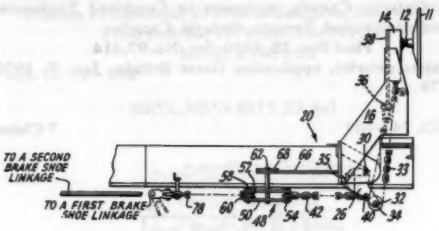
SELF-COMPENSATING RAILWAY HAND BRAKE LINKAGE

Ovie L. Sands, Shreveport, La., assignor to AMF Incorporated

Filed March 23, 1971, Ser. No. 127,211
Int. Cl. G05g 7/02
U.S. Cl. 74—491 **7 Claims**

A railway car hand brake mechanism employing lever

means and connecting linkages so constructed and arranged as to provide a multiplied braking force to the brake shoes.



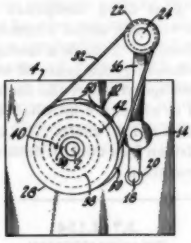
The multiplication factor remains substantially constant throughout the limits of movement of the mechanism.

3,712,147

MECHANICAL DRIVE MECHANISM WITH PROGRAMMABLE OUTPUT FUNCTION

Albert Bernstein, Sepulveda, Calif., assignor to RCA Corporation

Filed Sept. 29, 1970, Ser. No. 176,479
Int. Cl. F16h 27/02
U.S. Cl. 74—89.22 **7 Claims**



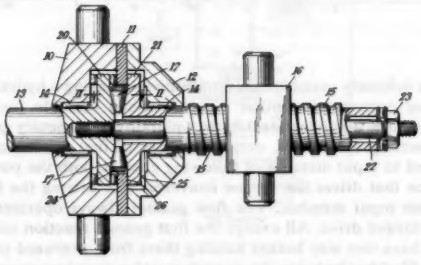
A mechanical device for causing the angle of an output shaft to be a desired programmable function of an input shaft angle. The input and output shafts are coupled by a tensioned belt which traverses an intermediate idler pulley. The desired function is provided by cam control of the distance separation between the axis of the input shaft and the idler pulley.

3,712,148

BALL SCREW JACK

Andrew James Murcott, Bridgnorth, England, assignor to H. M. Hobson Limited, London, England

Filed May 5, 1971, Ser. No. 140,523
Int. Cl. F16h 1/18
U.S. Cl. 74—424.8 R **4 Claims**



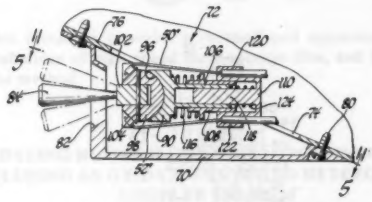
The invention relates to a ball screw jack for operating an aircraft flap, comprising a body, a rotary input member mounted in the body and constrained against axial movement with respect to the body, a ball screw also rotatably mounted in the body, a nut mounted on the ball screw, taper rollers interposed between angled faces on the input member and on the screw and serving to transmit torque from the input member to the screw, and a preload spring connecting the input member and the screw and urging the input member and the screw together, the drive through the taper rollers from the input member to the screw having a greater mechanical advantage than the drive from the screw to the nut.

3,712,149

REAR VIEW MIRROR OPERATING MECHANISM

Andrew J. Van Noord, Grand Rapids, Mich., assignor to Kent Engineering, Grand Rapids, Mich.

Filed April 30, 1971, Ser. No. 138,889
Int. Cl. F16c 1/14
U.S. Cl. 74—501 M **6 Claims**



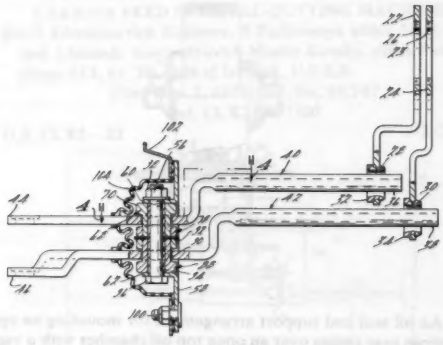
An operating mechanism for use with remote control rear view mirrors to allow fixed axes of pivotal support at the mirror location and preassembled use of sheathed control cables of fixed length therewith; said operating mechanism including a supporting member having pivotal means including first and second pivotal members at one end, with control cable ends attached to each thereof, reciprocal means on the other end of the supporting member including first and second reciprocal members biased in abutting relation against the ends of the cable sheathes, and a control lever attached to one of the pivotal members for selective actuation of both thereof.

3,712,150

COMPOUND MOTION TRANSMITTING LINKAGE

Steven L. Biro, Inkster, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 30, 1971, Ser. No. 176,082
Int. Cl. G05g 9/00
U.S. Cl. 74—473 R **8 Claims**



A compound motion transmitting lever mechanism adapted especially for use in controlling ratio shifts in a power trans-

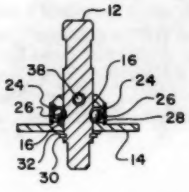
mission mechanism for an automotive vehicle comprising a rotary actuator lever, a remotely situated control lever, and an intermediate lever having a universal bearing support at a location intermediate its ends, one end of the intermediate lever being mechanically connected to one end of the actuator lever and the other end of the intermediate lever being connected to the control lever, wherein the universal bearing means accommodates both rotary motion of the intermediate lever about its axis of oscillation and angular adjustment thereof in a plane that is transverse to its axis of oscillation.

3,712,151

MINIATURE DETENT MECHANISM

Norman R. Diehl, Erie, N.Y., assignor to GTE Sylvania Incorporated

Filed June 1, 1971, Ser. No. 148,782
Int. Cl. G05g *5/06*
U.S. Cl. 74—527 **3 Claims**



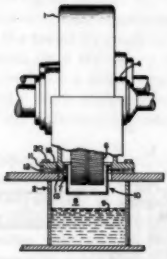
A miniature detent mechanism employs a rotatable shaft having a plurality of longitudinal serrations located on the periphery thereof. A housing including two balls and a ball race is positioned around the shaft in the area of the longitudinal serrations. A leaf style spring formed around the ball race exerts an inward force on the balls seating them into the shaft serrations whereby the shaft is detented in various radial positions.

3,712,152

GEAR UNIT OIL SEAL AND SUPPORT

Herbert N. Hoffman, Lunenburg, Mass., assignor to General Electric Company

Filed Nov. 19, 1971, Ser. No. 200,306
Int. Cl. F16h *57/02*
U.S. Cl. 74—606 R **3 Claims**



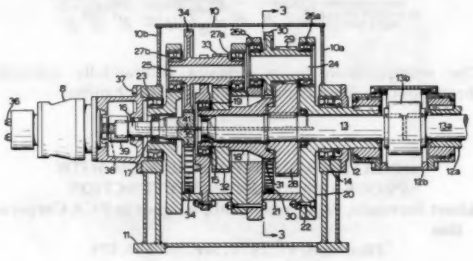
An oil seal and support arrangement for mounting an open bottom gear casing over an open top oil chamber with a vapor and fluid tight seal including provision for adjusting the height of the chocks or shims under the support areas of the gear casing for correcting machinery realignment without disturbing the seal.

3,712,153

INCREMENTAL GEAR DRIVE

Frank George East, and Frank Rouget Bichard, both of Toronto, Ontario, Canada, assignors to Combined Engineered Products Limited, Toronto, Ontario, Canada

Filed Dec. 28, 1970, Ser. No. 97,414
Claims priority, application Great Britain, Jan. 7, 1970, 717/70
Int. Cl. F16h *47/04, 37/08*
U.S. Cl. 74—687 **7 Claims**



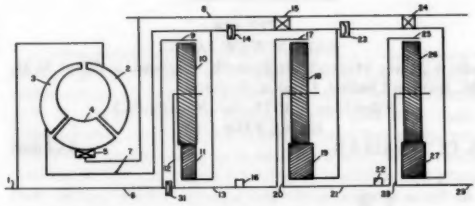
An incremental gear drive comprises input and output shafts journalled for rotation about a common axis, the shafts being drivingly connected through a multiple reduction gear train in a rotatable housing, the gears of which are caused to rotate at a controlled speed either the same as the housing or different therefrom to effect a controlled difference of speed between the input and output shafts. The unit includes a control shaft which is driven by a control motor, connected to the first pinion of the gear train.

3,712,154

TRANSMISSION

Arthur L. Welch, Box 5, Wasilla, Alaska

Filed Nov. 4, 1970, Ser. No. 86,752
Int. Cl. F16h *47/08*
U.S. Cl. 74—688 **1 Claim**

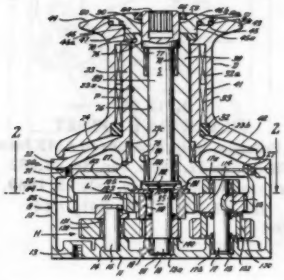


An infinitely variable speed transmission having a hydraulic torque converter or other variable speed variable torque mechanism supplying reaction to a plurality of planetary gearsets arranged in series, output member of first gearset connected to input member of following gearset, with the power source that drives the torque converter also driving the first gearset input member. The first gearset always operates in split torque drive. All except the first gearset reaction members have one way brakes holding them from rearward rotation. Clutches between the gearset reaction members connect them together to give split torque drive in the gearsets following the first one. A formula for determining ratios in planetary gearsets operating in split torque drive is given.

3,712,155
WINDING APPARATUS

Charles J. Stommel, 4122 Airline Drive, Houston, Tex., and William F. Hamilton, 215 North Sampson, Houston, Tex.

Filed Feb. 26, 1971, Ser. No. 119,223
Int. Cl. F16h 5/52
U.S. Cl. 74—810 6 Claims

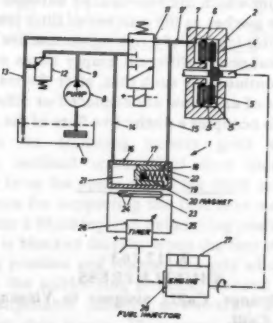


The specification discloses a winding apparatus such as a capstan for use on sailboats and the like wherein the capstan has a water tight housing enclosing a gear train for rotating a winding drum in a single direction and wherein the gear train includes a plurality of cam clutch gears slidable in one direction of rotation for providing one multiple of force on the drum in one direction of rotation of the power handle and another multiple of force on the drum when the power handle is rotated in the opposite direction.

3,712,156
CONTROL MECHANISM FOR FLUID-OPERATED VEHICULAR TRANSMISSION SYSTEM

Willi Kuhnle, 7990 Friedrichshafen, Germany, assignor to Zahnradrabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

Filed March 11, 1971, Ser. No. 123,185
Int. Cl. B60k 21/02
U.S. Cl. 74—858 5 Claims

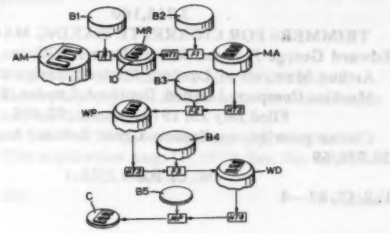


Upon the engagement of a hydraulic clutch or brake to shift gears in a vehicular transmission system, the change in hydraulic pressure is utilized to trip a timer for the temporary reduction of engine power during the shifting process.

3,712,157
DIE AND METHOD OF MANUFACTURE

Hans Otto Kratz, 44 Wells Hill Ave., Toronto, Ontario; Heinz Peter Schurman, 421 Abington Ave., Mississauga, Ontario, and George Steiner, 68 Heathdale Rd., Toronto, Ontario, all of Canada

Filed March 29, 1971, Ser. No. 129,106
Int. Cl. B21k 5/20; B21d 22/00
U.S. Cl. 76—107 R 8 Claims



This invention provides a method and apparatus for the manufacture of high speed steel coinage dies, and dies made by the method.

3,712,158
DYEING HUMAN HAIR AND COMPOSITION FOR INCLUDING AN OXIDATION DYE AND HETEROCYCLIC COUPLER THEREOF

Gregoire Kalopissis; Jean Gascon, both of Paris; Jacqueline Gallien, La Garenne Colombe; Andree Bugaut, Boulogne sur Seine, and Hubert Gaston-Breton, Paris, all of France, assignors to L'Oreal Societe Anonyme dite, Paris, France

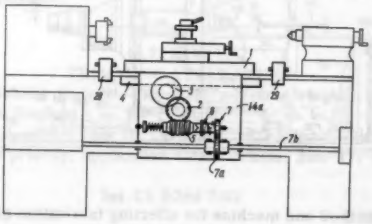
Division of Ser. No. 783,414, Dec. 12, 1968, Pat. No. 3,674,414. This application March 20, 1972, Ser. No. 236,498
Claims priority, application Luxembourg, Dec. 15, 1967, 55,116; Aug. 23, 1968, 55,759
Int. Cl. D06p 1/32
U.S. Cl. 8—11 4 Claims

A group of coupling agents, of which the following are representative: 3-dimethylamino-phenylurea, 3-dimethylamino-phenylthiourea, (3-hydroxy-6-methoxy)-phenylurea, (3-hydroxy-6-methoxy)-phenythiourea, (2,4-dimethyl-3-hydroxy)-phenylurea, (2,4-dimethyl-3-hydroxy)-phenylthiourea, and (4-methyl-3-hydroxy)-phenylthiourea. The invention also includes these couplers in association with oxidation dyes, and a method of dyeing hair using said compositions.

3,712,159
DEVICE FOR AUTOMATIC CUT-OFF OF TOOL CARRIER FEED IN METAL-CUTTING MACHINES

Ravil Khusainovich Galimov, 9 Podlesnaya ulitsa 54, kv. 26, and Alexandr Alexandrovich Modze Kevsky, ulitsa Pushkinskaya 213, kv. 30, both of Izhevsk, U.S.S.R.

Filed Dec. 3, 1970, Ser. No. 94,747
Int. Cl. B23b 21/00
U.S. Cl. 82—22 2 Claims



A device for the automatic cut-off of a tool carrier feed in metal-cutting machines and particularly thread cutting and

turret lathes in which a worm gear has its worm wheel linked kinematically with a mechanism for the progressive motion of the tool carrier while the worm is freely-mounted on the shaft and connected with a coaxially installed drive gear via a two-sided coupling member having large teeth which coact with teeth provided on the end surface of the worm and smaller teeth which coact with teeth located on the face of the drive gear.

3,712,160

TRIMMERS FOR CIGARETTE MAKING MACHINES

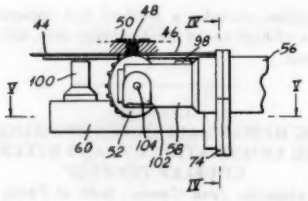
Edward George Preston; Robert Ernest Williams, and Philip Arthur Maw, all of London, England, assignors to Molins Machine Company Limited, Deptford, London, England

Filed July 23, 1970, Ser. No. 57,498

Claims priority, application Great Britain, Aug. 1, 1969, 38,738/69

Int. Cl. B26d *3/28*

U.S. Cl. 83—4 **13 Claims**



A trimmer for a cigarette making machine has two co-operating rotating discs and a rotary brush all of which are mounted on a carrier member capable of swinging up and down slightly about a pivot axis to vary the amount of tobacco removed by the trimmer. The pivot axis of the carrier part coincides with the axis of a drive shaft which drives the discs and brush via a shaft in the carrier part which has a bevel gear meshing with a bevel gear on the drive shaft.

3,712,161

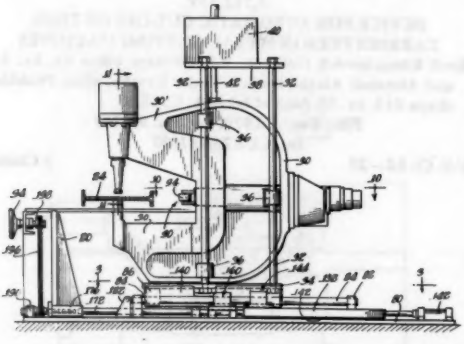
METHOD AND APPARATUS FOR FABRICATING ELONGATE STRUCTURAL MEMBERS, OR THE LIKE

Raymond L. Valente, Kankakee, Ill., assignor to Manco Manufacturing Co., Bradley, Ill.

Filed Dec. 2, 1970, Ser. No. 94,474

Int. Cl. B26f *1/02*

U.S. Cl. 83—50 **22 Claims**



A method and machine for effecting fabrication of a structural member, or the like, the machine comprising a work station having tooling means, drive means for advancing a structural member longitudinally of said station, and apparatus for properly positioning the tooling means with respect to predetermined locations at which tooling operations are to be performed on said structural member. The positioning apparatus includes an indexing arrangement, as well as gauge means which permit the automatic or semi-automatic operation of the machine, such that the tooling means may be initially positioned with respect to a transverse axis of the structural member and then moved along said axis in relatively short, controlled increments to and from the points at which the tooling operations are performed.

3,712,162

FILTER PLUG OFFSET

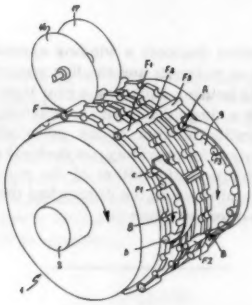
Filippo Giatti, Bologna, Italy, assignor to AMF Incorporated

Filed June 22, 1970, Ser. No. 48,082

Claims priority, application Italy, July 15, 1969, 7170 A/69

Int. Cl. B26d *7/06;* **B41j** *7/14*

U.S. Cl. 83—102 **2 Claims**



This invention is directed to continuously offsetting axially aligned double length filter plugs for cigarette making machines where rows of axially aligned double length filter plugs that are to be offset, are fed into discrete interspaced flutes of a rotary drum. The drum is provided with a number of peripheral longitudinal flutes, angularly and uniformly interspaced along the entire periphery of the drum such that two consecutive rows fed to the drum are caused to occupy two flutes of the drum which are interspaced between each other by as many flute pitches as the number of filter lengths within a row. All the filter lengths of a row minus one are transferred in an orderly manner to different empty flutes of the drum which rotates continuously such that, after the transfer, all of the filter lengths of each row are displaced or offset such that each filter length occupies a distinctive flute of the drum.

3,712,163

SHUTTLE PRESS

Paul Vinson, Orange, Calif., assignor to Vinson Industries, Inc., Orange, Calif.

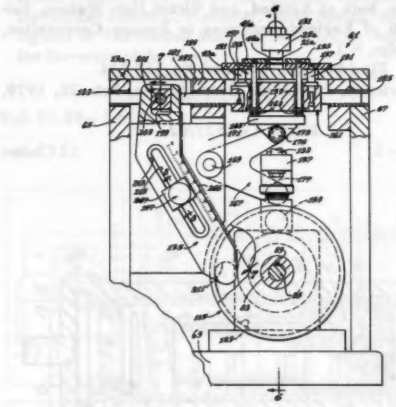
Filed June 15, 1970, Ser. No. 46,009

Int. Cl. B26d *5/20*

U.S. Cl. 83—206 **16 Claims**

A press for performing work operations on sheet material having at least one work station at which such work operations

are performed. The press includes a pair of secondary pads for retaining the material in position. The secondary pads are



movable in a shuttle or reciprocating type motion to progressively and intermittently feed the sheet material through the work station.

3,712,164

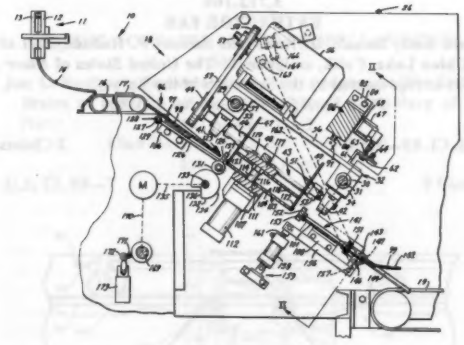
SAW FOR TRIMMING CAST GRIDS

Harry H. Meschke, Portage, and Ronald C. Van Linder, Watervliet, both of Mich., assignors to Winkel Machine Company, Inc., Kalamazoo, Mich.

Filed March 22, 1971, Ser. No. 126,861

Int. Cl. B26d *5/42*

U.S. Cl. 83—390 **5 Claims**



Apparatus for trimming battery grids supplied to a downwardly inclined track. First stop means is spaced downwardly from the upper end of the track and includes first support means for supporting the first stop means for movement between a blocking and unblocking position so that the battery grid is blocked thereby when the first stop means is in the blocking position and releases the grid when the first stop means is in the unblocking position. Second stop means is spaced an adjustable distance downwardly along the track from the first stop means. The second stop means includes support means for supporting the second stop means for movement between blocking and unblocking positions so that a grid is blocked and held between the first and second stop means when same is in the blocking position and releases the grid when same is in the unblocking position. Carriage means and drive means therefor are mounted on a guide for movement therealong. Rotating saw means are supported on the carriage and adapted to engage and thereby trim the grid as the carriage is driven along the guide. Clamping means are positioned between the first and second stop means and movable between open and closed positions and is adapted to clamp the grid in a fixed position during the trimming procedure. Control means are provided for causing a movement of the carriage means along the guide only when the clamp means is in the closed position.

3,712,165

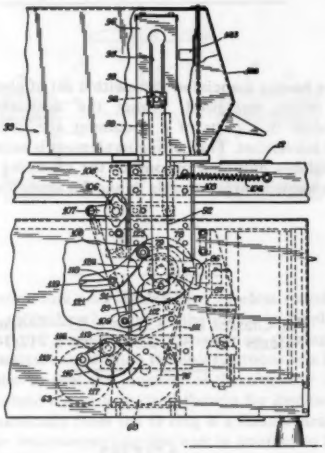
PASTRY PRODUCT PRODUCTION SYSTEM

Alfred Lake Meyer, Libertyville, Ill., assignor to Anestberger Brothers, Inc., Northbrook, Ill.

Division of Ser. No. 758,246, Sept. 9, 1968, Pat. No. 3,566,805. This application Aug. 17, 1970, Ser. No. 64,284

Int. Cl. B23d *25/04*

U.S. Cl. 83—289 **7 Claims**



Low-speed die cut unit for a pastry product production system having a belt conveyor for moving dough therethrough horizontally, comprising a vertically reciprocal die horizontally pivoted at its upper end, intermittently or continuously operable driving means for vertically reciprocating the die, horizontally reciprocable guide means operable by the driving means for moving the lower end of the die and including a backing plate under the conveyor, selectively adjustable means for varying the horizontal throw of the guide means, a normally inoperative clutch, pulse-responsive means for effecting cyclic operation of the clutch, pulse control means for periodically energizing the pulse-responsive means, means selectively operable to vary the period of the pulse control means, and a brake cyclically operable to stop the die at its uppermost position.

3,712,166

TRIMMING APPARATUS

Oliver Gabriel Rossetti, "Elmfield", West Alvington, Kingsbridge, England

Filed June 16, 1970, Ser. No. 3,276

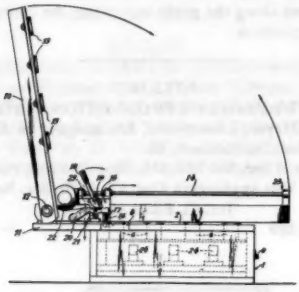
Claims priority, application Great Britain, Jan. 17, 1969, 2,884/69

Int. Cl. B26d *7/02*

U.S. Cl. 83—455 **5 Claims**

Apparatus for trimming and assembling separate parts of a document such as a plan or map, including a shallow box-like container having a supporting surface on which the parts may

be placed, the surface having a slit therein adapted to accept a cutting implement. A pair of clamping members are each pivotally mounted on the container so as to be pivotable between a raised position and a clamping position on the surface adjacent a respective side of the slit, each clamping



member having associated therewith a set of electro-magnets which, when energized, attract the associated clamping member so that parts of a document are held against undesired movement. The cutting implement is secured to a carriage slidably mounted on one of the clamping members so that the implement is movable to and fro along the slit.

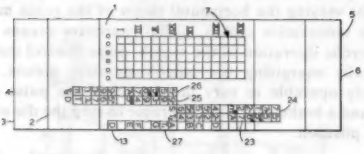
ERRATA

For Classes 83—835 thru 83—848 see:
Patents Nos. 3,712,348 thru 3,712,349

3,712,167
CHORD SLIDE RULE FOR MUSICAL INSTRUMENTS

Jacques R. Renault, 1210 South Drive, Socorro, N. Mex.

Filed Feb. 24, 1972, Ser. No. 228,806
Int. Cl. G09b *15/02*
U.S. Cl. 84—485 6 Claims

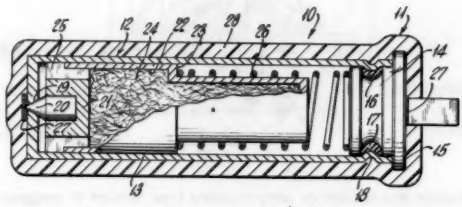


A slide rule for determining and displaying finger positions for various chords on the finger board of a stringed instrument, consisting of a primary transparent cursor on which is displayed the finger board grill of a stringed instrument and a tonality scale, and a plurality of secondary transparent cursors arranged to slide adjacent to and independent of each other and of the primary cursor with marks and scales displayed upon said plurality of secondary transparent cursors so that all possible finger positions on the stringed instrument can be displayed on the slide rule for any predetermined chord.

3,712,168
ARTICLE AND METHOD FOR PREVENTING ESCAPE OF PYROPHORIC MATERIAL

Frederich Vincent Summersford Mackness; John Norman Cheetham, both of Ashtead, and Victor Jack Watson, Tolworth, all of England, assignors to Ronson Corporation, Woodbridge, N.J.

Filed Feb. 22, 1971, Ser. No. 117,244
Claims priority, application Great Britain, Feb. 26, 1970, 9,485/70
Int. Cl. C06b *21/02*
U.S. Cl. 86—1 12 Claims

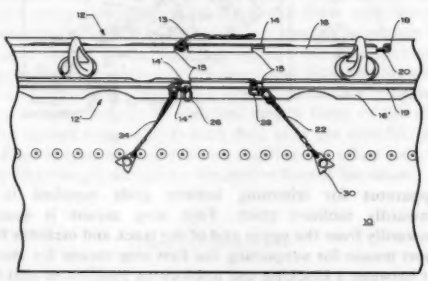


A method and an article to be encapsulated in which a relatively small cartridge containing a substance which is spontaneously combustible is completely sealed and enclosed in the encapsulating material. The encapsulating material can be a polyamide mixture having a tear strip embedded therein whereby a sharp pull on the strip will quickly release the cartridge from the encapsulating mechanism.

3,712,169
EXTRACTOR TAB

Irwin Koff; Ronald D. New, and Samuel P. Holladay, all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 5, 1971, Ser. No. 131,201
Int. Cl. B64d *1/04*
U.S. Cl. 89—1.5 D 2 Claims

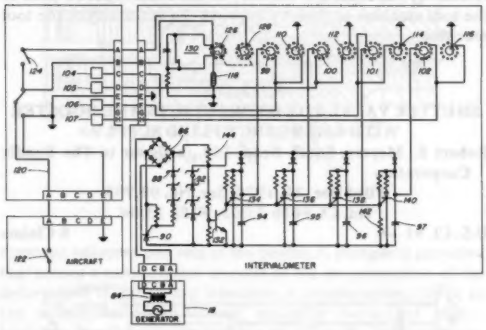


Identifiable fastening means is provided on each arming wire of an air-to-surface weapon and a unique extractor tab is substituted for the arming wire swivel loop at the weapon-aircraft interface. The tab fits into the usual slot of an arming solenoid and is contoured to provide increased mechanical advantage as the angle of pull on the arming wire increases.

3,712,170
AIRCRAFT ROCKET FIRING SYSTEM

Carl J. Campagnuolo, Potomac; Clayton D. McKindra, Hyattsville; Clinton J. Sewell, Silver Spring; Fernando Villarroel, Bowie, and Lionel L. Woolston, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 9, 1970, Ser. No. 44,679
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.814 **3 Claims**

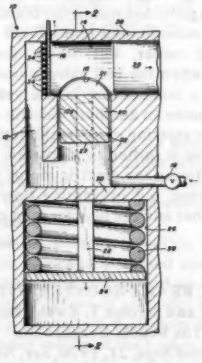


A system for firing aircraft rockets including a fluidic generator exposed to the airstream passing the launching aircraft in flight for generating the electrical power necessary to operate the firing circuit. The fluidic generator produces a voltage output when a predetermined minimum air speed is achieved to charge capacitors in the firing circuit. Silicon controlled rectifiers are shunted across the capacitors to immediately discharge them when the aircraft decelerates below the predetermined minimum air speed.

3,712,171
SPRING ACTUATED LIQUID PROPELLANT GUN SYSTEM

Jon L. Sweigart, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 16, 1970, Ser. No. 89,740
Int. Cl. F41f *1/04*
U.S. Cl. 89—7 **9 Claims**

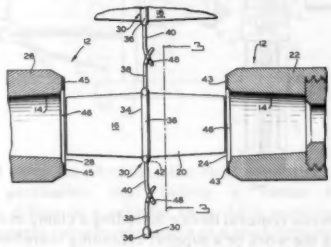


A gun system employs liquid oxidizers and fuels instead of the conventional solid propellants. To start a cycle, a propellant chamber is pressurized with liquid propellant to 5,000 PSI. The fluid pressure actuates a piston which is movable within the propellant chamber to automatically compress a spring. The piston is provided with commercial O-ring seals that are capable of withstanding the 5,000 PSI and seal the only opening in the propellant chamber. After pressurization a quick-acting valve is opened, and the spring-biased piston forces the liquid propellant through nozzles and into a combustion chamber where the ensuring combustion launches a projectile. Since the pressure in the combustion chamber equalizes with the pressure in the propellant chamber, the maximum pressure applied to the seals is the 5,000 PSI spring pressure.

3,712,172
LINK-SEAL UNIT FOR CASELESS AMMUNITION

Harold H. Wiese, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army

Filed July 23, 1970, Ser. No. 57,604
Int. Cl. F41c *21/12*; F42b *5/18, 39/08*
U.S. Cl. 89—17 **4 Claims**

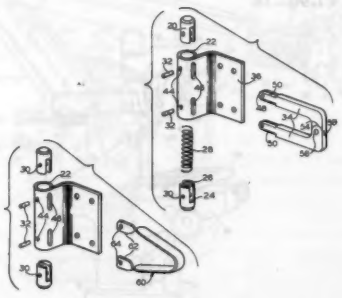


A combination link and seal unit for caseless rounds when used with a split chamber gun with relatively displaceable chamber sections, such unit comprising an O ring which retains the caseless round when the unit functions as a link and which acts also to seal the junction of the chamber sections when the retained round is located therein for discharge. Extending diametrically from the O ring is a female strap and a male strap for interconnecting one unit to another to form an ammunition belt.

3,712,173
SPRING LATCH FOR AMMUNITION CHUTE

Giulio Savioli, Davenport, Iowa, and Frank E. Piekos, Springfield, Mass., assignors to The United States of America as represented by the Secretary of the Army

Filed Aug. 14, 1970, Ser. No. 64,535
Int. Cl. F41d *9/02*
U.S. Cl. 89—33 BB **3 Claims**



The releasable retention of an ammunition chute to the feedway of a gun is accomplished by a pair of oppositely

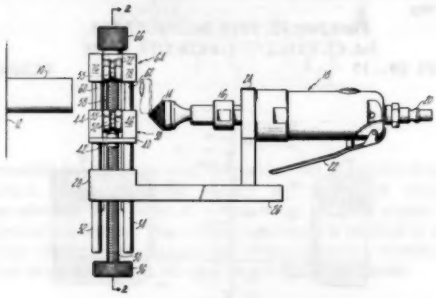
biased plungers slidably retained on each side of the chute for engagement with corresponding sockets in outwardly extending brackets on each side of the gun feedway. Axial displacement of the plungers is effected by a lever pivoted thereto at one end and joined at the opposite end thereof to permit compensatory movement at substantially right angles to the direction in which the levers are actuated whereby the forces transmitted to the plungers are limited to the axis of displacement thereof to prevent concurrent sticking and binding.

3,712,174

MATERIAL REMOVAL DEVICE

John S. Granfield, 295 Laurel Hill Road, Norwich, Conn.

Filed Jan. 6, 1971, Ser. No. 104,288
Int. Cl. B23c 1/20
U.S. Cl. 90—12 2 Claims



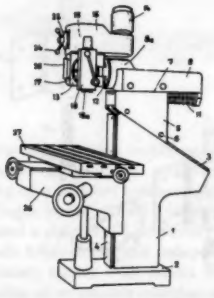
A material removal device including a clamp mechanism for engaging the work or a support extending therefrom by means of eight precision ground surfaces oriented along four parallel lines. The work engaging surfaces are defined by the exterior radial surfaces of two pair of precision bearings mounted on each of a pair of opposed jaw members, the jaw members being movable relative to one another and to the axis of rotation of a cutting tool.

3,712,175

MACHINE TOOL WITH INCLINED ADJUSTABLE CARRIAGE IN AN INCLINED GUIDE ARRANGED ON THE COLUMN OF THE MACHINE TOOL

Johann Muller, Unterhaching, and Leonhard Gschwendtner, Walchstadt, both of Germany, assignors to Friedrich Deckel Aktiengesellschaft, Munich, Germany, by said Katharina Muller, legal representative and heir of Johann Muller, deceased

Filed Dec. 10, 1970, Ser. No. 96,783
Claims priority, application Germany, Dec. 12, 1969, P 19 62 484.1
Int. Cl. B23c 1/12
U.S. Cl. 90—16 5 Claims



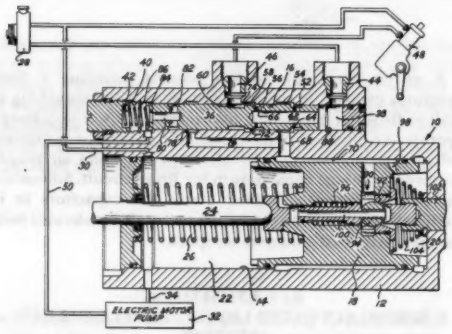
A machine tool having a carriage adjustable in an inclined guide arranged on a column. A tool head having a work spindle is arranged so that the spindle is perpendicular to the driving axis of the tool head. The tool head is driven by means of a driving motor and gearing provided therefor and is pivotable and lockable about an axis which is parallel to the front of the column. A transversely movable carriage is adjustably supported on the inclined carriage and is adjustable in a horizontal guide which is perpendicular to the front of the column. An adapter is pivotally and lockably secured to the transversely movable carriage about an axis which is perpendicular to the front of the column. The adapter has a torque transmitting means connecting the drive shaft of the gearing to the drive shaft of the tool head. The adapter includes means for releasably connecting a plurality of different types of tools to the tool machine to thereby improve the versatility of the tool machine.

3,712,176

SHUTTLE VALVE FOR HYDRAULIC BRAKE BOOSTER WITH EMERGENCY FLUID SUPPLY

Robert E. Meyers, South Bend, Ind., assignor to The Bendix Corporation

Filed Dec. 21, 1970, Ser. No. 99,793
Int. Cl. F01b 25/02; F15b 13/04
U.S. Cl. 91—6 8 Claims



A hydraulic brake booster is disclosed which is provided with an inlet port which communicates with the outlet of the vehicle power steering pump and an outlet port which communicates with the inlet of the vehicle's power steering gear. A ball valve within the booster housing admits fluid pressure into the high pressure section of a pressure chamber to operate a piston which applies the brakes of the vehicle. A shuttle valve is provided within the booster housing which normally permits substantially uninhibited flow of fluid between the inlet and outlet, but which restricts flow of fluid therebetween when the ball valve is opened. A flow-sensitive switch senses a malfunction in the vehicle's power steering pump and actuates an auxiliary electric motor pump when the vehicle's power steering pump malfunctions. When this occurs the shuttle valve is shifted to a position permitting fluid communication between the electric motor pump and the booster pressure chamber, but preventing flow of fluid between the pressure chamber and the booster inlet or outlet.

3,712,177

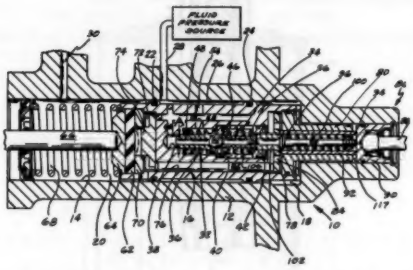
HYDRAULIC BRAKE BOOSTER WITH DISC REACTION

Lloyd G. Bach, and Jerome T. Ewald, both of South Bend, Ind., assignors to The Bendix Corporation

Filed Sept. 21, 1970, Ser. No. 73,934
Int. Cl. F15b 9/10
U.S. Cl. 91—369 A 7 Claims

A hydraulic brake booster is disclosed which includes a housing in fluid communication with a fluid pressure source and with a reservoir. A piston is slidably mounted in the hous-

ing, and valve means are provided to selectively admit fluid from the fluid pressure source to one side of the piston for shifting the latter within the housing to apply the brakes of the vehicle. Operator-actuated means are provided for controlling the valve means. Movement of the piston within the housing progressively pressurizes a deformable rubber member



disposed adjacent one end of the piston. A plunger is provided that senses a proportional amount of the pressurization of the deformable member and transmits a corresponding force to the operator-actuated means, opposing movement of the latter, to thereby provide braking "feel" to the vehicle operator.

3,712,178

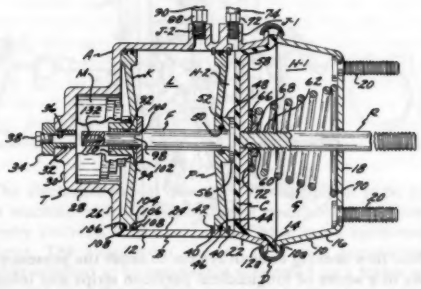
AIR OPERATED SPRING BRAKE

James R. Hensley, 1325 Nutmeg, Escondido, Calif.

Filed June 25, 1971, Ser. No. 156,665

Int. Cl. F01b *1/02, 7/00*

U.S. Cl. 91—170 R **11 Claims**



An air operated spring brake for use on automotive equipment that is normally actuated by air under pressure delivered thereto through a service line, but upon failure of the air supply a compressed volute spring automatically actuating a push rod to set the brakes on the vehicle.

The spring brake of the present invention has a positive pressure maintained in a second confined space thereof to prevent actuation of the volute spring, and air from this confined space in the event of failure of air under pressure in the main supply line, being discharged therefrom at a modulated rate to prevent the sudden setting of the brakes on the vehicle. In other words, the brake assembly of the present invention automatically brings the vehicle to a gradual stop, rather than the brakes being suddenly applied as occurs in prior art devices of this nature, when there is a failure of the pressurized air supply.

3,712,179

UNDERFEED CONTROL FOR PERCUSSION TOOL

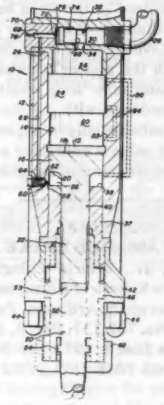
Laurence B. Hanson, Pine, Colo., assignor to Gardner-Denver Company, Quincy, Ill.

Continuation of Ser. No. 833,431, June 16, 1969, abandoned.

This application March 26, 1971, Ser. No. 128,515

Int. Cl. F01b *25/04;* **F01l** *25/04*

U.S. Cl. 91—220 **3 Claims**



A control valve for throttling the flow of motive air to a pneumatic percussion tool having a piston hammer reciprocably driven in a cylinder to strike a working implement. The control valve is responsive to a predetermined maximum pressure in an air cushion chamber formed between the piston hammer and the cylinder to throttle the flow of motive air to the tool when the working implement is not in proper blow-receiving position. Control air is communicated from the pneumatic cushion to operate the control valve; or, alternatively, a pilot valve may be used to sense a pressure signal from the cushion chamber to produce operation of the control valve.

3,712,180

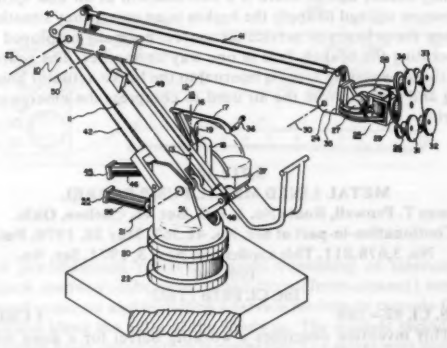
BILATERAL SERVO CONTROLLED MANIPULATOR

Donald L. Pieper, Schenectady, N.Y., assignor to General Electric Company

Filed Nov. 27, 1970, Ser. No. 93,223

Int. Cl. F01b *15/02;* **F15b** *9/03, 9/09*

U.S. Cl. 91—363 **5 Claims**



A slave servo loop including an electrical amplifier, a flow control servo valve and a slave actuator connected between

the control valve and a slave member is responsive when energized to a difference in the orientations of the slave member with respect to a master member for maintaining the slave member in alignment with the master member. A master servo loop is also provided including the aforementioned electrical amplifier, the aforementioned flow control servo valve, and a master actuator connected between the output of the control valve and the master member in a polarity to oppose, when energized, movement of the master member which produces movement of the slave member. On start-up of the manipulator, a lock valve connected in the lines between the control valve and the slave actuator hydraulically locks the slave actuator and hence the slave member. Any desynchronization of the slave member with the master member is eliminated by energization of the master servo loop which brings the master member into correspondence with the slave member. When the master member is substantially in alignment with the slave member, the slave lock valve is energized and allows the slave member to follow the movements of the master member.

3,712,181

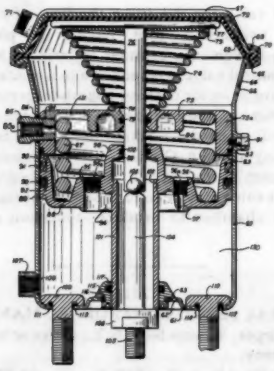
INTERNAL AIR ASSISTED BRAKE ACTUATOR

Kenneth D. Swander, Jr., Prairie Village, and Ronald D. Wilkins, Overland Park, both of Kans., assignors to Certain-Feed Products Corporation, Ardmore, Pa.

Continuation of Ser. No. 782,131, Dec. 9, 1968, abandoned. This application June 1, 1971, Ser. No. 148,921

Int. Cl. F01b *7/00, 21/02*

U.S. Cl. 92—63 **34 Claims**



A spring emergency and parking brake which is further air-assisted for added force in the application of the spring emergency brake; that is, there is a combination of air and spring pressure utilized to apply the brakes in an emergency situation when the primary or service air source, normally employed in operating the brakes, fails in one way or another. The source of the air-assisting force is internal to the brake actuator housing and derives from the air used to compress the emergency spring.

3,712,182

METAL LINED METAL PUMP BARREL

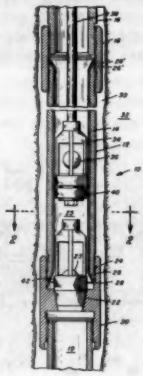
James T. Penwell, Route No. 1, P.O. Box 45, Chelsea, Okla.

Continuation-in-part of Ser. No. 41,367, May 28, 1970, Pat. No. 3,678,811. This application Nov. 3, 1971, Ser. No. 195,248

Int. Cl. F01b *1/02*

U.S. Cl. 92—169 **1 Claim**

This invention describes a working barrel for a deep well pumping unit. The working barrel comprises an outer steel pipe which is lined with a thin tubing of selected non-corrosive material. The inner corners of each end of the pipe is beveled. The lining is pressed outwardly against the inner surface of the pipe, and the liner and the pipe are welded together along the



periphery of the outer edge of each end, to make a seal so that there will be no fluid leakage between the liner and the pipe.

3,712,183

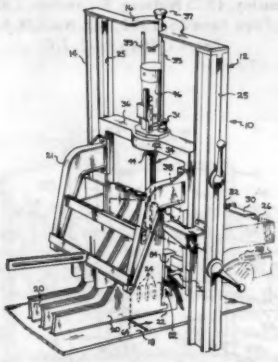
NOTCH SENSING CONTROL SYSTEM FOR A PARTITION ASSEMBLY MACHINE

Tadeusz Kozlowski, Toledo, Ohio, and Ernest H. Pemberton, Hoffman Estates, Ill., assignors to Owens-Illinois Inc.

Filed June 17, 1971, Ser. No. 153,955

Int. Cl. B31b *1/00*

U.S. Cl. 93—36 M **2 Claims**



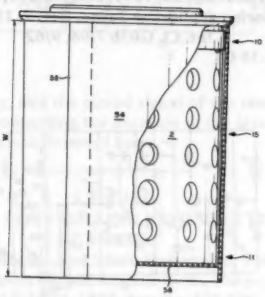
A fluid flow sensing control system to sense the presence of notches in a series of longitudinal partition strips and initiate the insertion of a cross strip into the notches in a continuous process to produce a cell-type filler for a carton. A stream of fluid under pressure is directed across a gap in a fluid flow interruption sensing head from a series of emitting orifices to a corresponding series of collecting orifices. One of a plurality of longitudinal partition strips is directed to pass through the gap in the sensing head, thereby disrupting the normal flow from the emitting to the collecting orifices. The passage of a notch in the longitudinal partition is sensed and the signal is processed by a fluid logic system, which in turn causes a transverse partition strip to be inserted by a feeding mechanism into the aligned notches in the longitudinal strips. It should be understood that longitudinal strips are in parallel with the sensed strip so that the transverse strip is inserted in all longitudinal strips at the same time. Also these sets of plural longitudinal strips are introduced in series into the insertion area. Provision is also made to automatically clear the collecting orifices of any buildup of corrugated material debris blown off of the longitudinal strips.

3,712,184

METHOD AND APPARATUS FOR FORMING A CONTAINER

Frank B. Flink, Overland Park, Kans., assignor to Phillips Petroleum Company

Filed April 26, 1971, Ser. No. 137,445
Int. Cl. B31b *1/34*
U.S. Cl. 93—39.1 R **10 Claims**



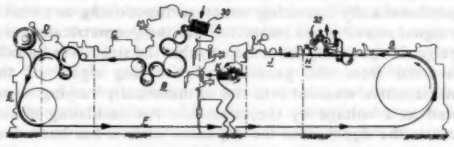
An apparatus and method for forming a container. A mandrel of the apparatus has an enlarged first end portion for reducing the area over which the container blank contacts the mandrel.

3,712,185

ENVELOPE FOLDING MACHINE

Rolando Falasconi, Pointe Claire, Quebec; Frank Joseph Daly, Beaconsfield, Quebec, and Richard Purdy, Laval, Quebec, all of Canada, assignors to Montreal Envelope Inc., Montreal, Quebec, Canada

Filed Nov. 5, 1970, Ser. No. 87,106
Int. Cl. B31h *21/00*
U.S. Cl. 93—61 R **3 Claims**



The disclosure herein describes an attachment to be added to a machine which normally forms open-side envelopes and thereby converts it to one capable of forming open-end envelopes. The attachment consists of a gum applicating assembly adapted to be removably supported on a frame which is secured over the machine just prior to the scoring section thereof; this gum applicating assembly consists of a series of rollers cooperating to transfer gum, collected from a gum recipient, to the scoring roller of the machine where it is applied on an envelope blank being conveyed below the scoring roller. The envelope blank is subsequently folded in the folding section of the machine in the usual manner to form an open-end envelope.

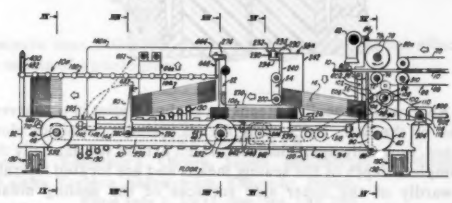
3,712,186

METHOD OF AND APPARATUS FOR FORMING STACKS OF A PRESELECTED NUMBER OF BLANKS

Albert L. Lulie, Baltimore, and Paul D. Harper, Timonium, both of Md., assignors to Koppers Company, Inc.,

Filed Dec. 28, 1970, Ser. No. 101,501
Int. Cl. B65h *33/00*
U.S. Cl. 93—93 M **30 Claims**

A method of and apparatus for forming a stack of corrugated paperboard blanks of preselected number comprising the steps of depositing such blanks sequentially into a first hopper forming a stack thereof; advancing a group of blanks of preselected number from the bottom of the stack and advancing the same into a second hopper; raising the group in the second hopper a sufficient distance to permit entry of a second group of blanks being advanced from the first hopper beneath the raised group in the second hopper; continuing this sequence until a final stack of blanks of preselected number is formed in the second hopper; then removing the final stack of blanks from the second hopper; and thereafter forming another final stack of blanks in the second hopper in the same manner. The apparatus for performing the method includes a first hopper with a first advancing conveyor on the bottom thereof; a gate for preventing advancement of the blanks in



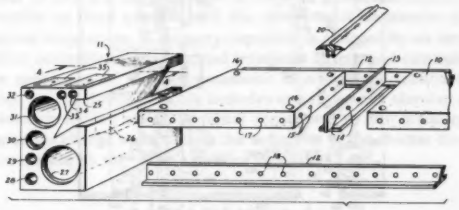
the hopper and to define a throat with the conveyor; a squaring assembly for squaring the blanks against the gate; the conveyor including advancing fingers for periodically removing a group of a preselected number of blanks from the bottom of the stack; a second hopper having an upstanding pivotable gate assembly for preventing advancement of the blanks in the second hopper; a second conveyor forming the bottom of the second hopper on which are secured lifting fingers for periodically raising the group of blanks in the second hopper to permit entry of another group of blanks from the first hopper beneath the raised group in the second hopper; and means for pivoting the pivotable gate assembly to permit the second conveyor to remove the final stack of blanks in the second hopper.

3,712,187

PREFABRICATED HIGHWAY SYSTEM

William Stelling, 175 W. 72nd St., New York, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,114
Int. Cl. E01c *9/00*
U.S. Cl. 94—4 **4 Claims**

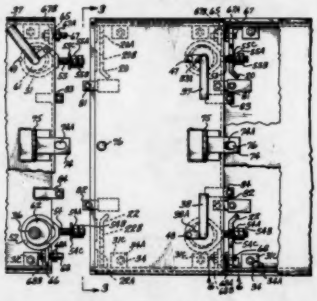


A prefabricated roadway system consisting of interconnected roadway slabs constructed from (ferro-cement) reinforced concrete and including a service module or console for location along the sides of the roadway. The module includes a built-in drain gutter which is connected to a sewer pipe going through the modules as well as provision for TV, telephone, and electrical cables, pneumatic mail chutes, water, gas, oil, steam and the like.

3,712,188
CONCRETE JOINT SEALING MEANS
Lee Worson, Los Angeles, Calif., assignor to Edoco Technical Products, Inc., Long Beach, Calif.
Continuation-in-part of Ser. No. 850,384, Aug. 15, 1969, abandoned. This application Nov. 16, 1970, Ser. No. 89,731
Int. Cl. E01c 11/10
U.S. Cl. 94—18 4 Claims

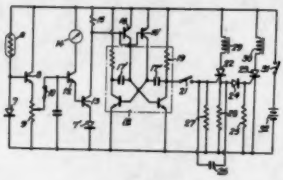
An elongated sealing means for sealing a joint in a concrete slab or the like. The sealing means includes a pair of elongated, upwardly open channels which extend substantially the complete depth of the sealing means and are located laterally inwardly of the outer side surfaces of the sealing means whereby the blades of a holding device can be inserted into the channels for laterally compressing the sealing means. Upon removal of the holding device, the sealing means expands to closely engage the adjacent portions of the slab defining the joint. Two embodiments are disclosed one in which the outer side surfaces are adapted for adhesive attachment to the walls of an already formed joint, and another in which the outer side surfaces incorporate integral, laterally extending wings which project into fresh or plastic concrete adjacent the sealing means and which are thereafter anchored in the joint upon setting of the concrete.

3,712,189
SCREED EXTENSION ASSEMBLY FOR ASPHALT PAVING MACHINE
Ralph D. Birtchet, Galvin, and James O. Carlson, Tacoma, both of Wash., assignors to Schneider-Simpson, Inc., Tacoma, Wash.
Filed Aug. 11, 1971, Ser. No. 170,752
Int. Cl. E01c 19/22
U.S. Cl. 94—45 R 12 Claims



Disclosed are interlocking extension units for extending the screed of an asphalt paving machine. Each extension unit has an open inner end having two rotatable shafts extending vertically there across. A cylindrical cam is welded to each of the shafts in an off-center position. Disposed about each of the cams is a steel ring having a bolt extending radially therefrom beyond the inner end of the unit, the bolt being adapted to be connected to a slotted plate in the outer end of an adjacent unit. Also protruding from the inner end of each unit are two adjustable guide studs each of which is adapted to mate with the slotted plate to facilitate alignment of adjacent units and provide a limiting surface against which an adjacent unit is drawn when the cams are rotated.

3,712,190
AUTOMATIC EXPOSURE CONTROLS FOR CAMERAS
Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Nov. 24, 1971, Ser. No. 201,743
Claims priority, application Japan, Dec. 7, 1970, 45/107651
Int. Cl. G03b 7/08, 9/62
U.S. Cl. 95—10 CT 7 Claims

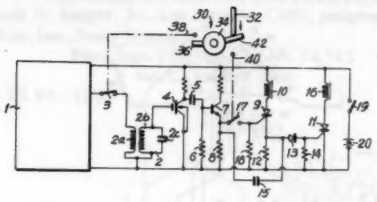


A camera having circuitry for automatically determining exposure of film in the camera. The circuitry includes a photosensitive element for receiving light from the object to be photographed and for converting the light into a corresponding electrical signal which varies according to a geometric progression. The signal is stored by a capacitor in the form of a voltage which varies according to an arithmetic progression. A logarithmically operating structure which includes at least one diode is electrically connected between the photosensitive element and the capacitor for converting the geometrically varying signal from the photosensitive element into the arithmetically varying signal stored as a voltage by the capacitor and for reconverting the signal stored at the capacitor into a geometrically varying signal which corresponds precisely to that of the photosensitive element, this logarithmetically operating structure functioning to convert the signal stored at the capacitor into the geometrically varying signal in precisely the same way that the signal was initially converted from the geometrically varying signal of the photosensitive element into the arithmetically varying signal stored as a voltage by the capacitor. An oscillating circuit receives the signal from the capacitor after it has been converted back into a signal varying according to a geometric progression by the logarithmetically operating structure, and this oscillating circuit drives shutter-operating structure which operates to open and close the shutter in accordance with the frequency of pulses of the oscillating circuit, this latter frequency being determined by the signal derived from the capacitor.

3,712,191
ELECTRICAL CIRCUITRY FOR CONTROLLING CAMERA SHUTTERS
Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Nov. 30, 1971, Ser. No. 203,178
Claims priority, application Japan, Dec. 26, 1970, 45/125252
Int. Cl. G03b 7/08, 7/62
U.S. Cl. 95—10 CT 10 Claims

A camera provided with electrical circuitry for controlling the shutter thereof. The circuitry includes a photosensitive circuit for generating a wave-shaped signal and a resonance circuit for temporarily storing the latter signal which is trans-

mitted to the resonance circuit which resonates at the frequency of the latter signal. This frequency is determined by



the light intensity, and the stored signal of the resonance circuit is used for controlling the duration of the interval during which the shutter is maintained open.

3,712,192

DEVICE FOR CONTROLLING EXPOSURE TIME IN A CAMERA

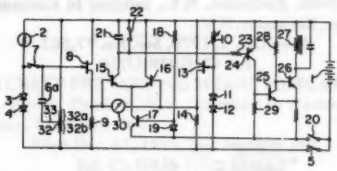
Shigeo Ono, Yokohama, and Ichiro Hamaguchi, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Feb. 24, 1972, Ser. No. 228,869

Claims priority, application Japan, March 3, 1971, 46/11118

Int. Cl. G03b 7/08

U.S. Cl. 95—10 CT **6 Claims**



A device for controlling exposure time in a camera includes a photoelectric converter circuit for converting the intensity of light passed through the camera's photo-taking lens into a voltage, a storage capacitor for storing the voltage, a magnet driving circuit for driving a magnet which controls the exposure time of the camera's shutter in accordance with the voltage stored in the capacitor, a power source, and two switches for discretely making and breaking a connection between the photoelectric converter circuit and the magnet driving circuit so that a current is supplied from the power source to the magnet driving circuit only during the shutter operation. A compensation circuit including a resistor is connected with the power source in parallel relationship with the photoelectric converter circuit and the magnet driving circuit. At least one end of the capacitor is connected with the compensation circuit so that the capacitor may be supplied with part of the terminal voltage of the resistor caused by a voltage drop occurring in the power source as it supplies a current to the magnet driving circuit.

3,712,193

SHUTTER SPEED INDICATING DEVICE FOR ELECTRICALLY CONTROLLED SHUTTER MECHANISMS

Yoshio Kuramoto, Sakai, and Hiroshi Ueda, Nara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

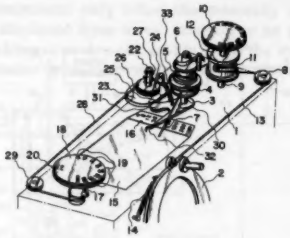
Filed Oct. 30, 1970, Ser. No. 85,545

Claims priority, application Japan, Oct. 31, 1969, 44/104002

Int. Cl. G01j 1/42; G03b 17/20

U.S. Cl. 95—10 C **4 Claims**

A shutter speed indication device comprises a following pointer coaxially rotated with the meter pointer and interlocking with a shutter speed setting dial for setting manual and automatic exposure time control to indicate the limit of the



exposure time within which camera movement will not affect the taking of a photograph.

3,712,194

CAMERA SHUTTER

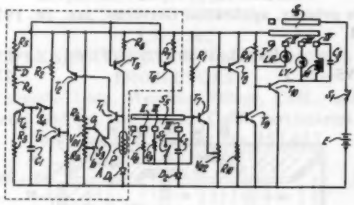
Hirofumi Yoshimura, Okaya, Japan, assignor to Kabushiki Kaisha Yashica, Shibuya-ku, Tokyo-to, Japan

Filed July 1, 1971, Ser. No. 158,795

Claims priority, application Japan, July 3, 1970, 45/57755

Int. Cl. G03b 7/08, 9/62

U.S. Cl. 95—10 CT **8 Claims**



An automatic shutter timing network for a single lens reflex camera including a selective automatic preset and manually adjustable diaphragm includes a bridge network including in its legs a photoconductor exposed to through the lens light, the output of a first transistor and the resistance element of potentiometer having a fixed contact and a contact adjustable with the automatic diaphragm adjustment. The input of a second transistor is connected to the bridge output, one terminal of which is alternatively switched to the potentiometer movable or fixed contact with the selection of automatic or manual diaphragm. A memory capacitor is charged by an amplifier controlled by the second transistor output and controls the resistance of the first transistor in an inverse feedback loop. An RC timing network includes as a resistance element a transistor having an input signal responsive to the memory capacitor charge and controls the actuation of the shutter closure release by way of an amplifier switch.

3,712,195

APPARATUS FOR PHOTOGRAPHING METEORS

Gale A. Harvey, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

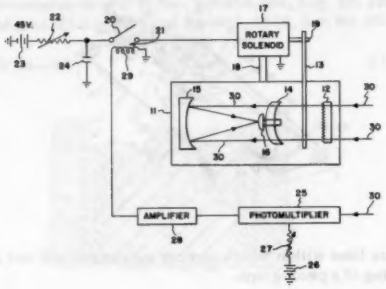
Filed Dec. 16, 1970, Ser. No. 98,774

Int. Cl. G03b 19/02

U.S. Cl. 95—11 R **2 Claims**

Apparatus for photographing meteors in a selected area of the sky only at times meteors are likely to be passing through the area. A photomultiplier is pointed in the direction of the area. When a meteor passes through the area the signal output

of the photomultiplier increases. Means are provided that activates a camera, pointed at said area, in response to an increased signal from the photomultiplier. Hence, the camera photographs the selected area only while meteors are likely to be passing through the area.

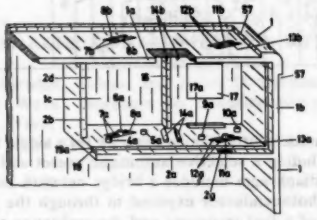


3,712,196

CAMERA VIEWER

Karl Heinz Lange, Ennigloh, Germany, assignor to Baldo Werke Photographische Gerate und Kunststoff R. Gruter Komman-ditegesellschaft, Westphalia, West Germany

Filed Dec. 10, 1970, Ser. No. 96,758
Claims priority, application Germany, Jan. 20, 1970, P 20 02 361.4
Int. Cl. G03b *13/02, 17/20*
U.S. Cl. 95—11 V 23 Claims



A camera viewer in the form of a box-shaped housing which is open at the front side. The operative element within the viewer housing are secured and placed through fastening elements in the form of spring and/or fixed supporting, clamping, retaining, and receiving arrangements. Stray light and reflection are reduced or eliminated through the application of ribs, projections, and studs which are integrally formed with the interior surfaces of the viewer housing. Part of the elements within the viewer interior are recessed within the inner surfaces of the viewer housing.

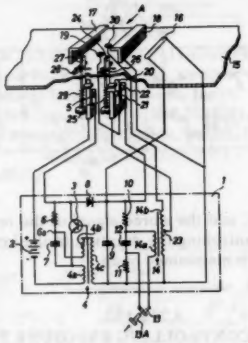
3,712,197

ILLUMINATING ARRANGEMENT FOR USE IN OR WITH PHOTOGRAPHIC APPARATUS

Karl Wagner, Ottobrunn, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 5, 1970, Ser. No. 87,142
Claims priority, application Germany, Nov. 8, 1969, P 19 56 319.0
Int. Cl. G03b *9/70*
U.S. Cl. 95—11.5 R 29 Claims

The housing of a photographic camera or a discrete illuminating device has a shoe for the foot of an electronic flash unit or a photoflash unit. The housing contains a current supplying circuit whose high-voltage generating portion is a transformer or a piezoelectric crystal and is connected with the tube of the electronic flash unit or with the lamp of the photoflash unit in response to connection of the respective unit to the housing. The tube or lamp is fired in response to opening of the shutter by the shutter release element.

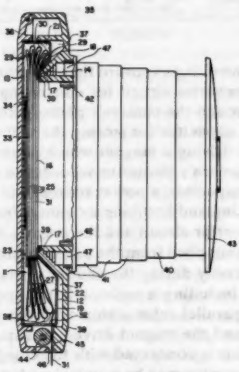


3,712,198

SELF-PROCESSING CAMERA AND FILM PACK FOR USE THEREWITH

Hubert Nerwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1970, Ser. No. 77,503
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 8 Claims



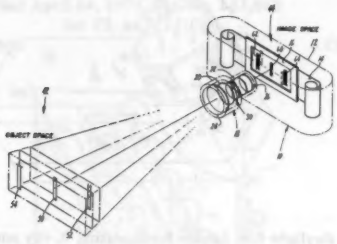
A self-processing camera, and a film pack including an assemblage of stacked individual film units in a disposable casing receivable in such camera. Each of the film units includes a central portion of one thickness supporting photosensitive material, and end portions of greater thickness supporting a rupturable pod and an excess-fluid trap. The central portions of the stacked film units are housed in a flat condition behind an exposure aperture of the pack while the thicker pod and trap portions are housed in thicker pack end portions. The camera is adapted to receive the pack and has a retractile lens and shutter assembly collapsible into the central or recessed compartment of the pack. By thus recessing the pack, the thickness dimension of the camera may be reduced by allowing the retracted camera objective to be located correspondingly closer to the camera body, and by enabling both the collapsed camera bellows or the like and the retracted lens and shutter assembly to be at least partially received between the forwardly extending compartments at the ends of the pack.

3,712,199

THREE-DIMENSIONAL COLOR PHOTOGRAPHIC PROCESS, APPARATUS AND PRODUCT

Jimmie D. Songer, Jr., Los Angeles, Calif., assignor to Video West, Inc., Santa Monica, Calif.

Filed Sept. 23, 1970, Ser. No. 74,762
Int. Cl. G03b 35/08
U.S. Cl. 95—18 R 7 Claims



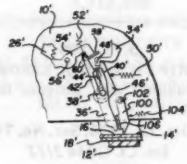
A color stereoscopic of three-dimensional picture system which is fully compatible with unaided two-dimensional viewing. A filter divides the lens aperture stop into left and right halves, and lets mutually exclusive portions of the spectrum pass through each half, preferably red left, and blue-green right. When viewed with glasses consisting of identical filters over the corresponding eye, psychophysiological illusion of 3-D is created.

3,712,200

FILM CREEP PREVENTING MEANS FOR CAMERAS

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1971, Ser. No. 209,209
Int. Cl. G03b 1/22, 17/42
U.S. Cl. 95—31 FM 11 Claims



A camera includes a transport mechanism for advancing perforated film along an exposure plane. A film sensing pawl is movable between a retracted position on one side of and spaced from the exposure plane and a position resting against the film surface where it may fall into a perforation of the advancing film to disable the transport mechanism when the perforation reaches a predetermined position. The sensing pawl may be held in its retracted position when the film is not being advanced. A member is movable into contact with the film after the film has been advanced to prevent the film creeping along the exposure plane.

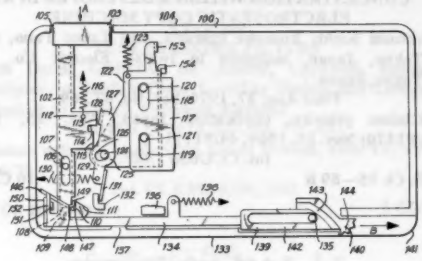
3,712,201

CONTROL MECHANISM FOR CAMERAS

Karl-Heinz Lange, Bunde, Germany, assignor to Balda-Werke, Postfach, Germany

Filed July 8, 1971, Ser. No. 160,673
Claims priority, application Germany, Aug. 13, 1970, P 20 40 283.9
Int. Cl. G03b 17/04, 19/00
U.S. Cl. 95—39 7 Claims

A control mechanism for cameras. The control mechanism includes an actuating component for actuating part of the camera as well as a manually operable component to be moved by the operator. A motion-transmitting structure transmits motion from the manually operable component to the actuating component only when the manually operable component is displaced from a rest position to an operative position. A locking structure releasably holds the manually operable component in its inoperative position while the manually operable component can be actuated to release the locking mechanism so that the manually operable component can move to its operative position. The locking mechanism when moving to its unlocking position actuates the motion-transmitting element to assume a position where subsequent manipulation of the manually operable component will bring about movement of the actuating component so as to produce the required movement of a camera component.

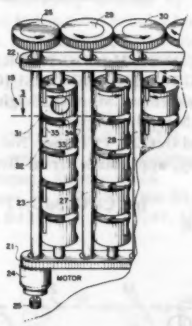


3,712,202

MULTIPLE SHUTTER SYSTEM FOR CAMERAS AND PROJECTORS

Paul Wentworth Lang, Westlake Village, Calif., assignor to Michael H. DuPont, Los Angeles, Calif., part interest

Filed June 16, 1971, Ser. No. 153,623
Int. Cl. G03b 9/52
U.S. Cl. 95—58 3 Claims



Side by side columns each comprising a plurality of shutters are positioned to co-operate with a rectangular array of lenses such that operation of any one shutter permits light to pass through an associated lens. The shutters take the form of axially aligned cylinders individually rotatably mounted to form the columns. Each cylinder has a lateral bore such that in one rotated position light is blocked and in a second rotated position light can pass through the bore. A variable speed drive motor with co-operating drive shafts applies rotative biasing forces on all of the cylinders simultaneously. Stop means associated with each of the cylinders holds the cylinders in their first rotated or light blocking positions. Individual operation of any one stop means serves to release the cylinder momentarily to permit it to make a half rotation whereby it passes throught its second rotated position to permit light to pass through the

associated lens. The stop means may be designed such that the cylinder can be stopped in its second rotated position for any desired length of time.

3,712,203

AUTOMATIC CONTROL DEVICE FOR THE TONER CONCENTRATION WITHIN A DEVELOPER IN AN ELECTROSTATIC COPY MACHINE

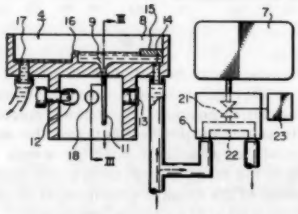
Hirotoshi Kishi; Yousuke Igarashi, and Takeo Tano, all of Tokyo, Japan, assignors to Iwatsu Electric Co. Ltd., Tokyo, Japan

Filed Aug. 27, 1970, Ser. No. 67,369

Claims priority, application Japan, Nov. 15, 1969, 44/91170; Nov. 15, 1969, 44/91171

Int. Cl. G03d *3/00*

U.S. Cl. 95—89 R 10 Claims



In a successive development of the images on an electrostatic copy machine, toner concentration within the developer is continuously detected in an optical manner and the supply of the toner to the developer is automatically controlled in accordance with thusly detected time sequential deviation in the toner concentration so as to compensate for the deviation, thereby the toner concentration can be maintained constant even when the copying operation is repeated many times in succession.

3,712,204

DEVICE FOR CONTROLLING THE REGENERATING OF PHOTOGRAPHIC PROCESSING SOLUTION

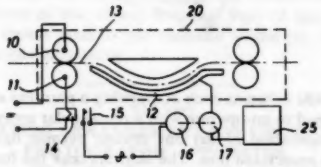
Marcel Frans Aelterman, Mortsel, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Oct. 29, 1971, Ser. No. 193,922

Claims priority, application Great Britain, Oct. 30, 1970, 51,788/70

Int. Cl. G03d *3/12*

U.S. Cl. 95—89 R 4 Claims



A device for controlling the regeneration of photographic processing compositions. The operation of the device is based on the separation of two electrically conductive rollers from each other as the film passes therebetween. The distance between the rollers causes a corresponding decrease in capacitance of roller electrode portions which in turn causes actuation of the regeneration device for replenishing the processing compositions.

3,712,205

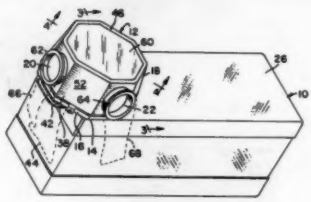
DAYLIGHT FILM LOADER

Henry F. Hope, 195 Welsh Road, Huntingdon Valley, Pa., and Stephen F. Hope, 2524 Wyandotte Road, Willow Grove, Pa.

Filed April 26, 1971, Ser. No. 144,569

Int. Cl. G03d *1/06*

U.S. Cl. 95—91 8 Claims



A daylight film loader for inserting X-ray and other photographic film into a film developing apparatus including a stationary base affixed to the film developing apparatus and overlying the film intake opening thereof. The base includes an upwardly extending, peripheral flange for removably receiving the bottom edge of the upper domed portion of the daylight film loader thereon. The domed portion of the film loader includes an enclosure having a substantially flat top and peripherally depending side wall, the said top incorporates a translucent area which is fabricated of acrylic plastic or other material suitable to filter light rays which may expose X-ray and other photographic film. The depending side walls include a pair of spaced openings for insertion of the arms and hands of the operator and the openings are protected against the entrance of light rays by light resistant vinyl sleeves which are respectively affixed thereto. In the preferred embodiment of the invention, the side walls of the domed portion and the cooperating base flange are formed to similar cross sectional configuration and cooperate to position the upper member in various angularly rotative positions with respect to the base member.

3,712,206

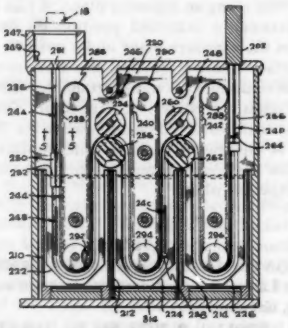
CHIP FILM PROCESSOR

Gunter Schmidt, Malibu, Calif., assignor to Productron, Inc., Los Angeles, Calif.

Filed Oct. 12, 1970, Ser. No. 79,798

Int. Cl. G03d *3/12*

U.S. Cl. 95—94 R 11 Claims



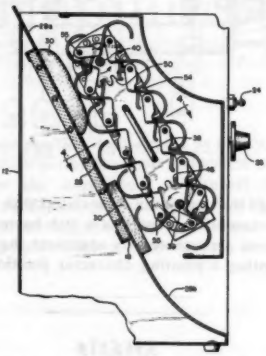
Apparatus for processing film chips without a darkroom comprising a developer for receiving film chips from a magazine and moving them through processing solutions. The developer has a pair of grooved guides that engage edges of film chips to guide them in loops that lead down into each tank

of processing solution and up and over into the next tank. The developer also has motor driven belts with fingers that push the chips along the grooves.

3,712,207
BUN TOASTER

William L. McGinley, 6142 Averill Way, Dallas, Tex., and Johnnie P. Pearson, Rt. 2, Box 147A, Terrill, Tex.

Filed April 14, 1971, Ser. No. 133,868
Int. Cl. A47j *37/08*
U.S. Cl. 99—349 6 Claims

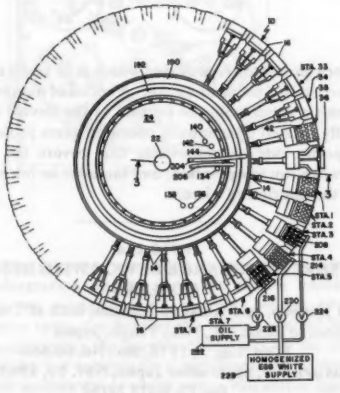


A bun grill has inclined conveyor means for conveying buns across the surface of a heating platen. Self-adjusting weights are attached to the conveyor means to hold buns pressed down uniformly against the heating platen during toasting, even though buns may vary in thickness. The weights have means to prevent the weights from contacting the platen or excessively crushing the buns.

3,712,208
APPARATUS AND PROCESS FOR PREPARING COOKED EGG PRODUCTS

George F. Adolphi, 7221 Amherst St., La Mesa, Calif.

Filed Aug. 28, 1970, Ser. No. 67,750
Int. Cl. A47j *43/20*
U.S. Cl. 99—373 16 Claims

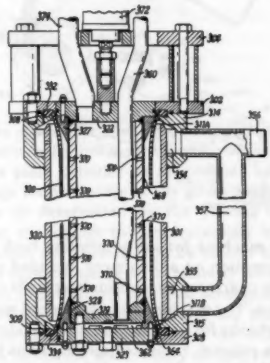


Apparatus in which bulk egg white is cooked in shaped molds under a layer of oil that is pressurized by gas to produce egg units in the simulated form of hard boiled egg halves, ready for filling with compatible food products. The process is carried out at a high rate of production in a machine having multiple arms carrying the molds on a rotating assembly, which is indexed to successive handling stations at which the steps of preparing and filling the molds, cooking, and ejecting the cooked product, occur automatically in sequence. Cooking is closely timed and performed in a safe manner by continuously circulating heated oil through the molds, which are maintained at a constant controlled temperature.

3,712,209
TUBE PRESSURE FILTERS

Ralph Derek Gwilliam, St. Austell, Cornwall, England, assignor to English Clays Lovering Pochin and Company Limited, St. Austell, Cornwall, England

Filed Feb. 1, 1971, Ser. No. 111,481
Claims priority, application Great Britain, Feb. 11, 1970, 6,696/70
Int. Cl. B30b *9/06, 5/02*
U.S. Cl. 100—112 5 Claims

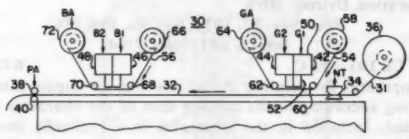


The inlet for the hydraulic pressure fluid which is fed to the outer compartment of a tube pressure filter, which comprises a pair of co-axial tubular bodies forming between an annular chamber which is effectively divided by an impermeable elastic sleeve secured to the outer tubular body into inner and outer compartments, is provided by an annular inlet extending around the periphery of the outer tubular body.

3,712,210
COLOR BAR PRINTER

Donald E. Landis, Cambridge, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed June 30, 1970, Ser. No. 51,073
Int. Cl. B41f *1/44*; B41j *5/44, 33/00*
U.S. Cl. 101—93 C 23 Claims



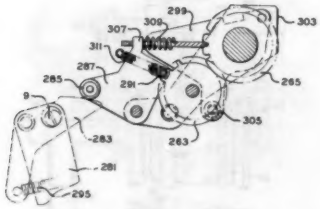
A printer, which includes a pair of green printing elements and a pair of black printing elements, causes a sequence of green, black, and white colored bars to exist on a tag, where the green and black bars are printed and the white bars are the tag color resulting from a lack of printing. The tag is moved through the printer in discrete steps of two bar widths at a time, so that two new areas of the tag are beneath each pair of printing elements after each discrete movement. Signals are then applied to those printing elements which are then to print bars. A ribbon, which is associated with each pair of printing elements, is moved one bar width each time a print signal is

applied to the pair of printing elements. This movement occurs after the leading one of the printing elements prints and before the trailing one of the printing elements prints. Logic circuitry is also included for converting a binary code into signals representing the colored bar code and for providing necessary signals to the printing elements and the ribbons. The code-converting circuitry uses a module three up-down counter, and the then existing count in the counter represents the then required color bar.

3,712,211
ALIGNMENT MEANS FOR A BED AND PLATEN PRINTING MACHINE

Paul John Thut, Penfield, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 30, 1970, Ser. No. 85,445
Int. Cl. B41j 29/00
U.S. Cl. 101—93 MN 3 Claims



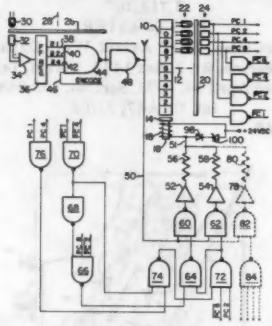
An office machine for use in printing both numerical and symbol information on a document intended to be processed by automatic character recognition machines of the optical or magnetic type. The machine has a keyboard with a plurality of separate keybanks for entering the numerical or symbol information to be printed, keyboard sensing arms for determining the information entered into each keybank and a print wheel for each keybank of the keyboard and under the control of the keyboard sensing arms for setting up the information to be printed. A moveable platen cooperates with the print wheels to provide a printing couple for impressing the characters to be printed against a document. An inking ribbon lies between the line of characters set up on the print wheels and the document. When the printing couple is closed, the ribbon transfers ink to the document to be printed in a pattern corresponding to the characters on the print wheels. The Printing couple will print single and multiple documents such as a multi-part form with equal pressure and with controlled embossment of the print type into the document.

3,712,212
VARIABLE PRINTER INTENSITY CONTROL

Jack Beery, Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 12, 1971, Ser. No. 198,156
Int. Cl. B41j 9/00, 7/94
U.S. Cl. 101—93 C 6 Claims

Apparatus for printing characters with an impact intensity varying according to the surface area of the character being printed. Included in the apparatus is a cyclically movable character bearing member, such as a rotary print wheel or drum or an endless belt and one or more print hammers cooperable with the member forming a printing couple for printing characters. An electromagnetic field produced by a solenoid initiates the flight of the hammer against a document which may be moved relatively thereto as the printing operation is performed. The current through the solenoid coil is limited by resisters of different values which are controlled by electrical gates for selectively varying the amount of current supplied to the coil for driving the hammer. The timing of the printing is kept in synchronization with the document movement by means of an electromechanical clock capable of dividing each character position into an equal number of zones. During the operation of the printing apparatus, the sequence of accessing the digits to be printed, positioning the print wheel, and firing the hammer continues as the document

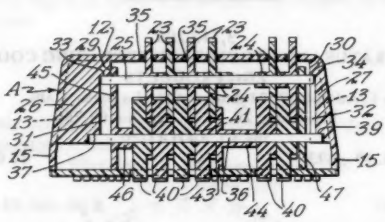


moves through the apparatus. Associated with the print wheel and jointly rotatable therewith is a disk having a plurality of coded positions represented by apertures therein each position representing a printing character position on the print wheel.

3,712,213
PORTABLE CHECK PROTECTOR

Reginald B. Flemino, St. Paul, Minn., assignor to Golden Age Industries, Ramsey, Minn.

Filed Oct. 19, 1970, Ser. No. 81,787
Int. Cl. B41j 27/04, 3/58
U.S. Cl. 101—108 4 Claims



A check protector is provided which is of small enough size to be carried in a purse or pocket. A series of numeral imprinting wheels project from the bottom of the device and are individually rotated by manually operated gears projecting from the opposite side. A removable cap covers the imprinting wheels when not in operation, and includes an ink pad engageable by the imprinting wheels.

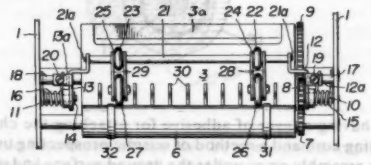
3,712,214
COPY SHEET DISCHARGE DEVICE WITH REMOVABLE ROLLERS

Tamaki Kaneko, and Katsumi Mizuno, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1970, Ser. No. 60,694
Claims priority, application Japan, Nov. 13, 1969, 44/87271
Int. Cl. B41f 13/54
U.S. Cl. 101—232 7 Claims

A printed copy sheet discharge device for rotary offset printing machines which is effective to control the relative positions of an impression cylinder of the duplicator and a pair of copy sheet discharge rollers comprising an adjustably

spring-loaded shaft, parallel to the shaft of said impression cylinder and on which the rollers are rotatably mounted and maintained in contact with or spaced apart a small distance from the peripheral surface of said impression cylinder so as to facilitate discharge of printed copy sheets from the impression cylinder. The roller shaft is mounted at either end in spring-



loaded arms whose position is adjustable by means of suitable set screws and which permit the shaft and rollers to be readily removable from the duplicator. Additional rollers are mounted on the roller shaft, which cooperate with a cylindrical delivery roller having suitable rings thereon for further guiding of the copy sheets into a receiving tray.

3,712,215

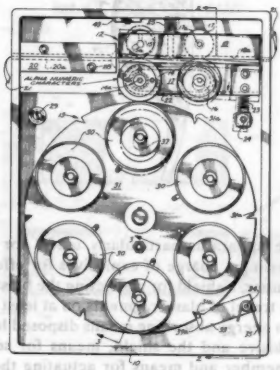
PRINTING APPARATUS

Edson Wayne Cunningham, Temple City, Calif., assignor to Royal Industries, Inc., Pasadena, Calif.

Continuation-in-part of Ser. No. 863,460, Oct. 3, 1969, abandoned. This application May 27, 1971, Ser. No. 147,375

Int. Cl. B41f *5/04*, *1/46*, *31/34*

U.S. Cl. 101—219 **8 Claims**



A portable printing apparatus prints and color codes selected information on an elongated ribbon which is advanced between a printing roller carrying inkable characters and a pressure roller for holding the ribbon against the printing roller and printing the inkable characters on the ribbon as it advances. An ink roller with a self-contained supply of ink has an outer surface from which ink is releasable upon pressure contact with the ink roller to transfer ink to the inkable characters. In one form of the invention, several of the ink rollers are mounted on a rotatable turret. Each ink roller is adjustable independently toward and away from the printing roller so that ink of a plurality of colors may be selectively transferred to the inkable characters.

3,712,216

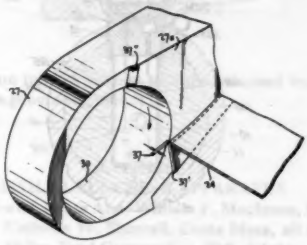
INK ROLLER FOUNTAIN

Jimmie A. Harrod, Middleport, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Division of Ser. No. 885,748, Dec. 17, 1969, Pat. No. 3,651,758. This application March 26, 1971, Ser. No. 128,509

Int. Cl. B41f *31/06*

U.S. Cl. 101—363 **2 Claims**



An ink transfer system for a rotary printing press wherein a helically grooved transfer roll is provided for effectively transferring toward a plate cylinder an ink volume consistent or equal to the usage requirements at any given point or area on the roll surface as determined by the printed image. The transfer roll has the ability to simultaneously transfer ink reversely back onto the fountain roll by reason of its helical grooves being in light contact with a relatively slowly rotating fountain roll. An offset groove and ball arrangement is provided for one of the distribution rolls in the printing press chain of rollers so as to smoothly oscillate the roll for a more even distribution of the ink transversely of each roll in the ink train. The inner face of each fountain roll mount is slightly relieved so as to direct ink away from the outermost ends of the fountain roll thereby substantially preventing fountain leakage.

3,712,217

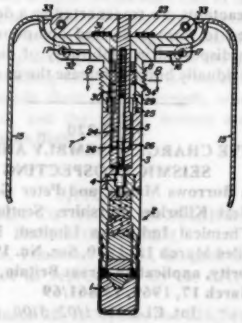
DISPENSER LAUNCHED AIR ARMING BOMB FUZE

Vincent C. Little, Fullerton, Md.; Aaron S. Berlin, Wilmington, Del., and Toney C. Leadore, Havre de Grace, Md., assignors to the United States of America as represented by the Secretary of the Army

Filed June 2, 1970, Ser. No. 42,632

Int. Cl. F42b *25/16*

U.S. Cl. 102—4 **7 Claims**



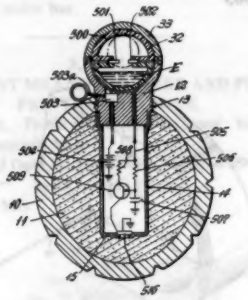
An apparatus and method for arming a munition in flight without separation of the arming device from the munition.

3,712,218

SAFETY GRENADE

James P. Fay, 18 France St., Norwald, Conn.

Division of Ser. No. 847,852, Aug. 6, 1969, Pat. No. 3,636,878.
This application July 9, 1971, Ser. No. 161,092
Int. Cl. F42c 13/00
U.S. Cl. 102—70.2 5 Claims



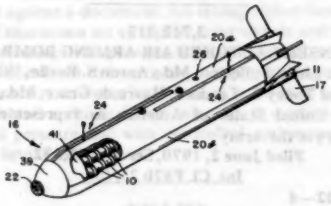
A grenade having electrical control means for arming the grenade in response to a predetermined free flight thereof and for firing an armed grenade in response to interruption of said free flight of the grenade, said control means having a safety time factor for preventing arming of the grenade in response to short periods of free flight. Means can also be provided for preventing unintentional operation of the grenade.

3,712,219

AERIAL DISPERSAL OF CHEMICALS

James E. Blair, China Lake, and Richard I. Jackson, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 21, 1968, Ser. No. 731,692
Int. Cl. F42b 25/16
U.S. Cl. 102—7.2 3 Claims



Chemical reactants are transported to a delivery site where they are mixed to form a desired compound and the compound is then dispersed in a plurality of discrete containers which are individually burst to release the compound.

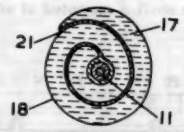
3,712,220

EXPLOSIVE CHARGE ASSEMBLY AND ITS USE IN SEISMIC PROSPECTING

Douglas John Burrows Marke, and Peter George Thompson, both of West Kilbride, Ayrshire, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Filed March 13, 1970, Ser. No. 19,345
Claims priority, application Great Britain, March 17, 1969, 13,860/69; March 17, 1969, 13,861/69
Int. Cl. F42d 1/02, 3/06
U.S. Cl. 102—23 7 Claims

A method of assembling blasting explosive charges on an initiating line of detonating cord which method is especially advantageous in seismic prospecting involves sticking the charges on the detonating cord by means of a layer of adhesive. The invention also includes the blasting assembly comprising the detonating cord and adhering charges, a blasting



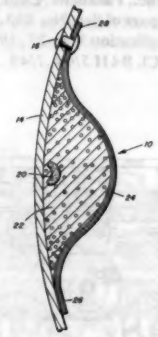
charge having a layer of adhesive for attaching the charge to detonating cord and a method of seismic prospecting using the blasting assembly on or under the ground surface and substantially parallel thereto.

3,712,221

BLAST SHIELD FOR EXPLOSIVE DEVICES INCLUDING LINEAR SHAPED CHARGES

H. William Voigt, Jr., Stanhope; Joseph Gulbierz, Dover, and Charles Yearwood, Hopatcong, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Jan. 18, 1971, Ser. No. 107,381
Int. Cl. F42b 1/02
U.S. Cl. 102—24 HC 7 Claims



An explosive apparatus particularly useful for severing a member comprising a charge of explosives for effecting fracture of the member, a shield for restricting the blast effect and for limiting the travel of blast fragments on at least one side of the member, an energy absorbing means disposed between the charge of explosive and the shield, means for securing the shield to the member and means for actuating the explosive charge.

3,712,222

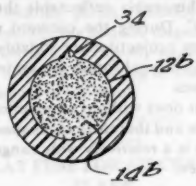
PYROTECHNIC FUSE

Jack Y. Richardson, Mouth-of-Wilson, Va., and Dale F. Mellow, Stanhope, N.J., assignors to Brunswick Corporation, Chicago, Ill.

Filed March 12, 1970, Ser. No. 6,750
Int. Cl. F42h 3/10
U.S. Cl. 102—27 R 16 Claims

A substantially uniform pyrotechnic fuse is provided by using particulate pyrotechnic mixture compacted in a small

tubing. By preselecting the pyrotechnic mixture, the fuse can have a burning rate up to 35 seconds per inch. The pyrotechnic fuse material can also be preselected to provide either a flexible or substantially rigid fuse structure.



3,712,223

PYROTECHNIC, WHISTLE, AND METHOD OF MAKING

Ralph G. Degn, 214 A University Village, Salt Lake City, Utah

Filed Oct. 7, 1970, Ser. No. 78,921
Int. Cl. C06d *1/00*
U.S. Cl. 102—31 10 Claims

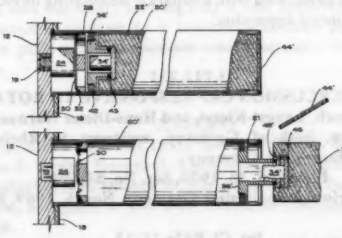
A pyrotechnic whistle and method of producing same which prevents a minimum danger of explosion formed of a tubular reaction chamber and a pyrochemical mixture formed by mixing together a salt of salicylic acid and an oxidizing agent. Finely divided titanium is added to the pyrochemical mixture or to other pyrochemical mixtures formed of aromatic acids and oxidizing agents to provide a trail of glitter when the pyrochemical mixture reacts.

3,712,224

DECOY FLARE WITH TRAVELING IGNITION CHARGE

Joseph W. Hanzel, Sardis, Miss., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 21, 1971, Ser. No. 155,090
Int. Cl. C06d *1/04, 1/10*
U.S. Cl. 102—37.6 3 Claims



Cartridge type decoy flares are provided with ignition devices which will ignite the flare only after it has left the bore of the dispenser. Safety means is provided which remains in effect until after the flare has cleared the muzzle of the bore.

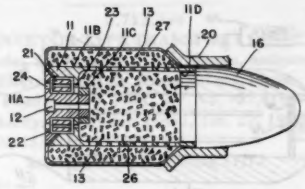
3,712,225

AMMUNITION

Osyp Nimylowycz, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed May 7, 1970, Ser. No. 35,374
Int. Cl. F42b *5/30*
U.S. Cl. 102—38 4 Claims

Ammunition cartridge cases for guns in which the combustion chamber is larger in diameter than the gun tube. Upon consumption of the propellant charge the cartridge shell collapses to a size smaller than the gun tube diameter for ejection through the gun tube or muzzle with the attached base which has its own gas generating means.

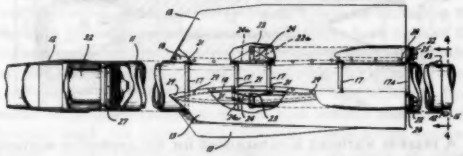


3,712,226

MISSILE LAUNCHING APPARATUS

Arthur Moskowitz, Santa Ana; William F. MacInnes, New Port Beach, and Calhoun W. Sumrall, Costa Mesa, all of Calif., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Division of Ser. No. 777,250, Nov. 20, 1968, Pat. No. 3,605,549. This application Oct. 9, 1970, Ser. No. 79,652
Int. Cl. F42b *15/10, 15/16*
U.S. Cl. 102—49.3 3 Claims



A rocket powered missile and cooperating launching tube from which the missile can be catapulted at high initial velocity. The missile includes a hollow fuselage section which is telescopingly fitted over a launching tube open at its forward end and closed at its rearward end. Stabilizing fins and rocket motors are provided on the fuselage section, and a gas generator is provided toward the forward end of the section to supply sufficient gas pressure within the launching tube to launch the missile. Prior to launching, the missile is held on the launching tube by shear pins. Ignition of the gas generator pressurizes the launching tube so that the resultant force on the shear pins exceeds their shear strength, whereupon the missile is launched, and the rocket motors are ignited to propel the missile in its flight.

3,712,227

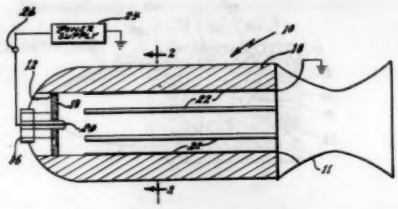
ELECTRICALLY CONTROLLED SOLID ROCKET IGNITION SYSTEM

Stewart W. Turner, Lancaster, Calif., assignor to the United States of America as represented by the Secretary of the Air Force

Filed March 22, 1971, Ser. No. 126,740
Int. Cl. F42c *19/12*
U.S. Cl. 102—49.7 1 Claim

An electrically controlled solid rocket ignition system including a resistance wire initiator for igniting pyrotechnic

material. After ignition, a high voltage is applied between forward and aft electrodes which are positioned on or near the surface of the propellant. This produces an electrostatic field



which permits controlled movement of heated ions and/or electrons from the flame zone to the remaining unignited surface of the propellant. Ignition delay time can thereby be precisely controlled.

3,712,228

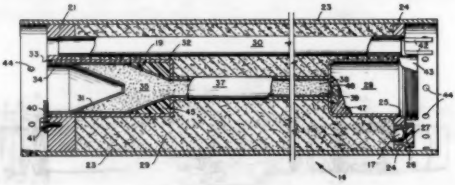
TARGET MARKER WARHEAD

George S. Handler; Kenneth R. Foote, and Milton K. Burford, all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 26, 1969, Ser. No. 803,528

Int. Cl. F42b *13/36, 13/42*

U.S. Cl. 102—60 **9 Claims**



A marker warhead is substituted for the explosive warhead of a guided missile so as to give an indication of the point of the fuze function or impact of the missile and mark the target for accurate delivery of conventional weapons.

3,712,229

MISSILE HAVING A CASING AND CONTAINING SECONDARY PROJECTILES

Julius Schock, 8102 Oberengstringen, Switzerland, assignor to Werkzeugmaschinenfabrik Oberlikon-Buhrle AG, Zurich, Switzerland

Filed July 12, 1971, Ser. No. 161,574

Claims priority, application Switzerland, July 17, 1970, 10902/70

Int. Cl. F42b *13/50*

U.S. Cl. 102—69 **11 Claims**

A missile of the type having a casing composed on individual segments containing movable secondary projectiles, the segments in a locked position being mutually parallel, and means for allowing a head wind striking the missile in flight to swing the segments radially outwards.

Each segment contains a plurality of secondary projectiles. The segments are hingeably deflectable through an angle of approximately 170°. During the outward swing of the segments the secondary projectiles are slidably ejected from the segments by the centrifugal forces generated by the outward swing of the segments.

This arrangement does without an ejecting charge for each secondary projectile and therefore saves space.

In addition there is a relatively wide range of scatter of the secondary projectiles.

3,712,230

FIRING EQUIPMENT FOR SIMULATING GUNFIRE

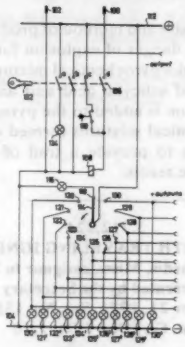
Oswald Hoffmann, 4032 Lintorf, Germany, assignor to Hoffman-Werke J. Oswald Hoffman, Lintorf, Germany

Filed Sept. 16, 1970, Ser. No. 72,669

Claims priority, application Germany, Sept. 23, 1969, P 19 47 989.1

Int. Cl. F42c *19/12*

U.S. Cl. 102—70.2 R **4 Claims**



Firing equipment for simulating gunfire having a plurality of firing cups for accommodating pyrotechnic devices and each firing cup is associated with a separate detonating device to be set off by control apparatus.

3,712,231

SAFETY-PERCUSSION CAP RESPONSIVE TO ROTATION

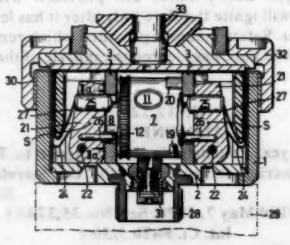
Lothar Petzsch, Langst-Kierst, and Hans-Dieter Harnau, Hasslinghausen, both of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed Oct. 28, 1970, Ser. No. 84,594

Claims priority, application Germany, Nov. 6, 1969, P 19 55 812.4

Int. Cl. F42c *15/22*

U.S. Cl. 102—79 **8 Claims**



A safety-percussion cap responsive to rotation which comprises a rotor capable of being set up in firing position and in-

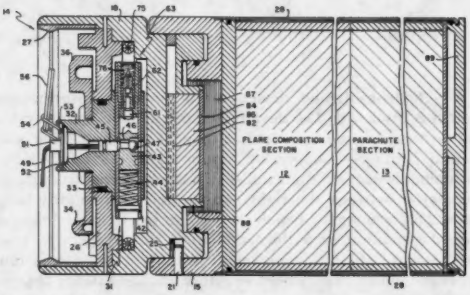
cluding locking means movable by centrifugal force and capable of being put out of engagement with the rotor. Bearing plates carry the rotor. The locking means include swingably locking bolts disposed on both sides of the rotor. The locking bolts engage the bearing plates. The locking bolts have a locking pin and a holding pin and are disposed each parallel to the axis of the rotor and operatively engage the rotor. They have additionally a spring including a worm toothing, and a spring causes the set up of the rotor.

3,712,232

VARIABLE DELAY FUSE FOR AIRCRAFT PARACHUTE FLARE

Carroll Abel, Shoals; John R. Clifton, Bedford, and James R. Lueking, Bloomfield, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 23, 1968, Ser. No. 769,999
Int. Cl. F42c 9/10
U.S. Cl. 102—85.2 **2 Claims**



A fuse and ejection device for an aircraft parachute flare having an expellant charge for separating a parachute and flare from an outer container, a stationarily mounted delay fuse for igniting the expellant charge, and a rotatable triggering device for selectively igniting different lengths of the delay fuse whereby the time of free fall of the parachute and flare within the outer container can be varied. A safety locking ring is provided to prevent accidental triggering of the expellant charge and the safety locking ring is first removed by the pull of a lanyard secured to a launching aircraft and then the lanyard pulls a disconnect pin which actuates the triggering device.

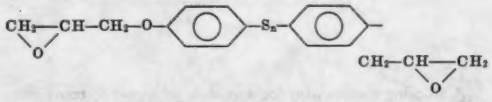
3,712,233

CASELESS PYROTECHNIC SMOLDERING MUNITION

Stevens S. Drake; George A. Lane, both of Midland; Gerald R. Staudacher, and Donald W. Girardin, both of Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 28, 1971, Ser. No. 110,649
Int. Cl. C06d 7/00
U.S. Cl. 102—103 **7 Claims**

Disclosed is a pyrotechnic smoldering munition for dissemination of the lacrimator O-chlorobenzal malononitrile (CS). The munition is made up of a pyrotechnic composition having a fire retardant coating. The pyrotechnic composition comprises the copolymerization product of an aromatic sulfur containing epoxy resin corresponding to the formula:



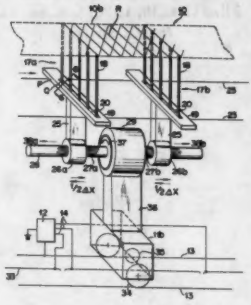
where *n* is 1 to 2 with maleic anhydride as binder fuel. In addition to the binder fuel, the pyrotechnic composition comprises potassium chlorate as oxidizer together with the lacrimator (CS). The flame retardant coating, which contains ports for ignition of the pyrotechnic composition and exit of vaporized (CS), is a polyester resin produced by the condensation of dibromoneopentyl glycol and a mixture of phthalic and maleic anhydrides with an unsaturated monomer.

3,712,234

CONVEYOR TYPE TRANSPORT DEVICE

Moritada Kubo, Shibuya-ku, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanasaki-shi, Japan

Filed Jan. 19, 1971, Ser. No. 107,815
Claims priority, application Japan, Jan. 22, 1970, 45/5430; Jan. 22, 1970, 45/5431
Int. Cl. B65b 9/12; B65g 21/12
U.S. Cl. 104—25 **12 Claims**



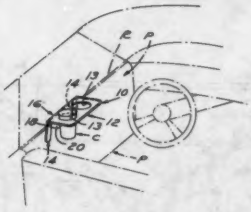
A conveyor type transport device comprising a passageway movable in the form of an endless loop divided into a plurality of segments capable of expansion and contraction; segment length control means for varying said length by changing the distance between a pair of members fitted to both ends of the segment; electric motor devices provided in the same number as the segment length control means and made to move along said looped movable passageway while supporting it from below in coupled relationship with said control means; and a looped track for said motor devices, wherein the segment length control means is so designed as to cause an object placed at a particular point on the movable passageway to be carried along at a different speed from the average speed of said passageway with the entire length of the loop kept unchanged.

3,712,235

CUP HOLDER

Edwin Russ, Madison Heights, Mich

Filed Aug. 11, 1971, Ser. No. 170,842
7 Claims



The holder has a pair of elongated anchoring leg extensions connected by hinge formations to a flat article supporting panel, the legs, panel and formations being molded of a suitable synthetic plastic composition in the form of a one-piece unit. The panel and each of the anchor legs carry bracing and stop elements, integrally molded on the respective leg and panel parts, which elements carry tongue and groove-type edge formations for frictional and releasable mating engagement with one another when the holder is set up on an operative article supporting condition. As thus set

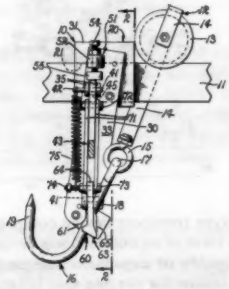
up the legs extend downwardly into the usual upwardly opening window recess of an automobile door, with the supporting panel extending horizontally inwardly of the door to one side of and just ahead of an occupant. The respective leg and panel-borne bracing and stop elements then have edge-abutting stop engagement with one another; yet upon manual disengagement of said elements from their mated relationship the legs may be swung into a compactly collapsed relation to the article supporting panel.

3,712,236

MEAT HOOK RETAINER

Leondro A. Massaglia, San Mateo, Calif., assignor to Leo Kusber, Daly City, Calif., a part interest

Filed Oct. 30, 1970, Ser. No. 85,559
Int. Cl. B61b *3/00*
U.S. Cl. 104—93 **6 Claims**



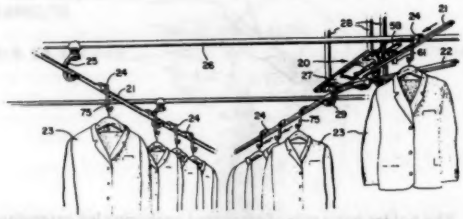
A meat hook retainer having a hanger clamp releasably adjustably positionable on a meat hook rail and including a hook clamping mechanism releasably to hold meat hooks in stationary relation to the rail in optimum meat receiving position.

3,712,237

RIGHT ANGULAR CROSS-OVER SWITCH FOR CONVEYOR TRACK SYSTEM

John H. McElroy, 14 East Roosevelt Circle, Red Bank, N.J.

Division of Ser. No. 715,414, March 22, 1968, Pat. No. 3,605,628. This application May 4, 1970, Ser. No. 47,924
Int. Cl. E01b *25/26*; B65g *47/74*
U.S. Cl. 104—99 **3 Claims**



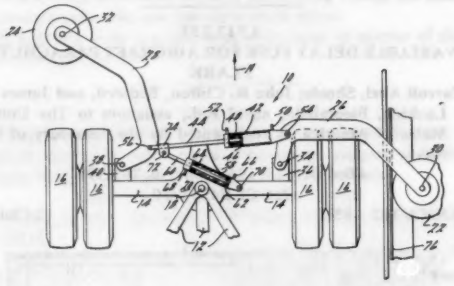
A semi-automatic switch mechanism particularly for monorail type trolley conveyor tracks which is characterized by extreme simplicity of construction and operation. The switch takes advantage of the operation of a spring-loaded toggle linkage and a pivoted shifter member struck by a trolley for shifting a flexible switching track section into alignment selectively with either of two angularly disposed track sections, such as a main track section and a branch section.

3,712,238

VEHICLE SWITCHING DEVICE

Denny D. Colovas; John S. Logan, and Richard R. Skruch, all of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 4, 1971, Ser. No. 186,211
Int. Cl. E01c *9/02*
U.S. Cl. 104—130 **10 Claims**



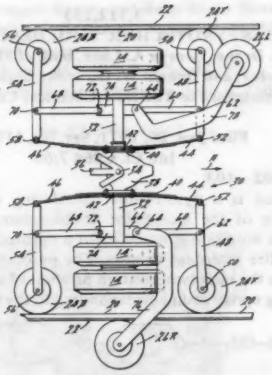
A vehicle switching device for a guided transportation system is disclosed. The device includes an axle with its central portion secured to a vehicle support structure. First and second structures deployably mount right and left vehicle switching devices on the axle. A first deployment structure is connected between the right and the left vehicle switching devices for spacing the two devices either in a first condition, a second condition or a third condition with respect to one another. A second deployment structure is connected between the first deployment structure and the axle for changing the position of the first deployment structure with respect to the axle. The operation of the deployment structures is effective to deploy the right, or the left, or neither of the vehicle switching devices.

3,712,239

STEERING MECHANISM

Denny D. Colovas; John S. Logan, and Richard R. Skruch, all of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 4, 1971, Ser. No. 186,212
Int. Cl. E01c *9/02*
U.S. Cl. 104—130 **6 Claims**



A steering mechanism for a vehicle of a guided transportation system is disclosed. An axle for the vehicle has a central portion pivotably connected to supporting structure of the vehicle. The axle has vehicle wheels secured to opposite ends thereof and steering structures located adjacent associated

vehicle wheels. The steering structures include front and back guide wheels for engaging a guide rail to direct the vehicle along the transportation system. The front and the back guide wheels are interconnected with a spring secured to the axle which acts to bias them into engagement with the guide rail. Structure is provided which permits the devices interconnecting the guide wheels and the spring to move relative to the associated vehicle wheel whereby the spring is loaded or unloaded depending upon the direction of movement. Any loading and unloading of the spring causes the axle to be pivoted about its connection with the vehicle support structure whereby the vehicle is steered. The steering mechanism also includes a deployable switching device for holding the guide wheel in contact with the associated guide rail when the switching device is deployed.

3,712,240

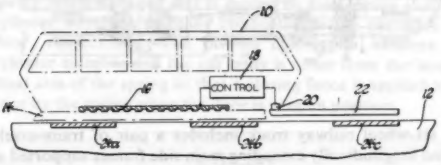
LINEAR ELECTRIC MOTOR PROPULSION SYSTEM

Richard H. Donlon, Littleton, and William R. Hamilton, Aurora, both of Colo., assignors to Transportation Technology, Inc., Denver, Colo.

Filed Feb. 23, 1971, Ser. No. 117,999

Int. Cl. B60l *9/16, 11/00, 13/00*

U.S. Cl. 104—148 LM **8 Claims**



A linear motor propulsion system for vehicles adapted to travel along a fixed roadway comprising primary and secondary motor elements, one of which is carried by the vehicle and the other of which is disposed in a discontinuous fashion along the roadway. A constant thrust profile is achieved by arranging the length and spacing of the elements such that a constant area of projected surface coextension exists between the elements irrespective of the vehicle position along the roadway.

3,712,241

ENDLESS TOWING CONVEYOR

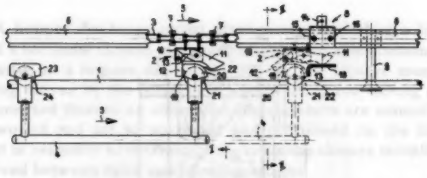
Erich Kuwertz, 6751 Trippstadt, Germany, assignor to Pfalzstahlban GmbH, Pirmasens/Pfalz, Germany

Filed Jan. 4, 1971, Ser. No. 103,431

Claims priority, application Germany, Nov. 18, 1970, P 20 56 704.8; Nov. 20, 1970, P 20 57 082.5

Int. Cl. B65g *17/42*

U.S. Cl. 104—172.5 **11 Claims**



Endless towing conveyor having a suspension track disposed below the towing chain for running carts rolling thereon, where the movable part of a coupling device is disposed between a towing chain and running carts exclusively on the drivers or dogs of the towing chain and cooperate with a curved member on the running carts which is rounded forwardly in the direction of advancement and equipped with a vertical abutment surface in the back.

3,712,242

SNOW AND ICE TRACK CLEARER FOR GROUND EFFECT MACHINES

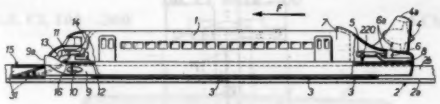
Jean Henri Bertin, 92 Neuilly-sur-Seine, France, assignor to Bertin & Cie, Plaisir, France

Filed June 30, 1970, Ser. No. 51,263

Claims priority, application France, July 1, 1969, 6922116

Int. Cl. B61f *19/00*

U.S. Cl. 104—279 **10 Claims**



Arrangement for clearing snow and ice clad tracks in particular for ground effect machines.

An arrangement for vehicles such as ground effect machines running along a carrying and guiding track, wherein a turbo-machine carried by or incorporated with the vehicle feeds through a tapping on the turbine or on the associated compressor a hot fluid at a comparatively high pressure into nozzles adjacent the track surface and facing forwardly so as to undermine, release and blow away the ice and snow on the track. Further nozzles may be directed away from the track and towards the walls confining the fluid cushions sustaining and guiding the vehicle.

3,712,243

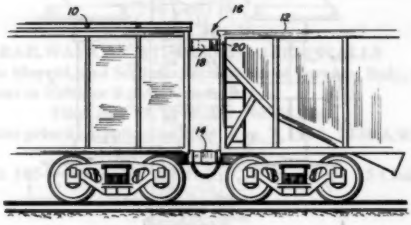
RAILWAY CAR ROLL STABILIZATION

Frans V. A. Pangalila, Matawan Township, N.J., assignor to John J. McMullen Associates, Inc., New York, N.Y.

Filed Oct. 7, 1969, Ser. No. 864,967

Int. Cl. B61f *5/06, 5/14;* **F16c** *17/04*

U.S. Cl. 105—1 A **8 Claims**



The present invention relates to the stabilization of the roll of railroad cars. In a first embodiment, a plurality of railroad cars are stabilized by using the energy built up in one car to cancel the energy built up in adjacent cars. In a second embodiment, a railroad car is stabilized by providing means for changing the resonant frequency of the car if the roll angle experienced by said car exceeds a predetermined value. The third embodiment of the present invention provides for the stabilization of a railway car by limiting the maximum angle at which the car may roll. In a fourth embodiment, the tracks on which a railway car travels are altered in order that the wheels of the car encounter discontinuities at a rate wherein the possibility of the car rolling at resonance is eliminated. The fifth embodiment of the present invention employs a vibration absorber which oscillates itself, thereby absorbing energy which would have been absorbed by the car.

3,712,244
AUTOMATICALLY ALIGNED RAILWAY CAR VESTIBULE

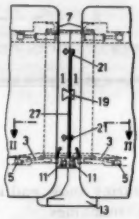
Paul Vollenweider, and Franz Wagner, both of Neuhausen, Switzerland, assignors to Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Germany

Filed April 7, 1971, Ser. No. 131,909

Claims priority, application Switzerland, June 4, 1970, 8354/70

Int. Cl. B60d *5/00;* **B61f** *17/14, 17/20*

U.S. Cl. 105—21 **4 Claims**



A gangway for railway carriages having an automatic central coupling including two rigid gangway tunnel halves sealed to the carriage ends and elastically joined to the tunnel halves and catch horns are provided for exact alignment and locking bolts for connecting.

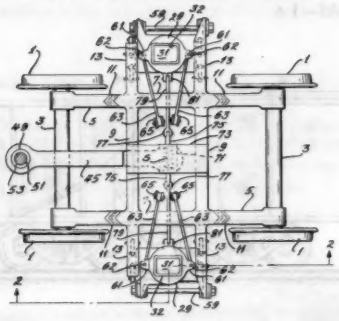
3,712,245
AUTOMATICALLY POWER BANKED RESILIENT RAILWAY CAR TRUCK

Richard L. Lich, Town and Country, Mo., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed Jan. 28, 1971, Ser. No. 110,530

Int. Cl. B61f *3/08;* **B62f** *5/10;* **B61f** *5/24*

U.S. Cl. 105—164 **21 Claims**



Railway vehicle suspensions are provided in which the vehicle body is supported directly on truck mounted spring devices for transverse tilting movement about a longitudinal central axis of the body. Transversely acting power means are provided to hold the body against such transverse tilting movements during tangent track operation and to cause such transverse tilting movements, or banking, when rounding curves. In one embodiment of the invention the spring devices at each side are supported from the truck frame by transversely swingable links whose projections intersect at the tilt axis and the vehicle body is supported by horizontal bearings on the spring devices. The truck frame mounts a transversely acting power device which is connected to the spring devices. In another embodiment, the spring devices are carried directly by the truck framing, and support the body by spherical section bearings whose common center is at the intersection of the truck swivel axis and the tilt axis. A transversely acting motor mounted on the body is connected at its ends to the spring devices to produce lateral and consequent tilting movements of the body on the spring devices.

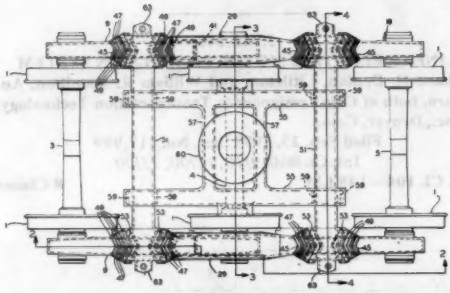
3,712,246
ELASTOMERICALLY ARTICULATED RAILWAY TRUCK

Richard L. Lich, Town and Country, Mo., assignor to General Steel Industries, Inc., Granite City, Ill.

Filed Aug. 30, 1971, Ser. No. 175,912

Int. Cl. B61f *3/10, 5/08, 5/17*

U.S. Cl. 105—196 **9 Claims**



A six-wheel railway truck includes a pair of transversely spaced longitudinally extending main side frames supported at their ends on the ends of two adjacent axles, and a pair of similarly spaced longitudinally extending auxiliary side frames supported at their one end on the third axle and at their other end on the main side frames between the two first mentioned axles by a horizontal elastomeric pad device. Between the middle axle and each of the end axles, each side frame supports a pair of elastomeric chevron springs with their compression axes inclined upwardly longitudinally of the truck toward each other, and a load supporting bolster between each of the respective axles has transversely extending tips supported on the chevron springs, and a body supporting center plate over the middle axle.

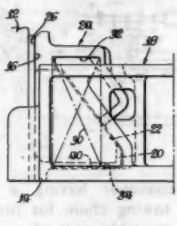
3,712,247
BOLSTER SNUBBER WEAR PLATE

Donald Marion Young, Hazel Crest, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed March 2, 1971, Ser. No. 120,205

Int. Cl. B61f *5/06, 5/12, 5/50*

U.S. Cl. 105—197 DB **2 Claims**



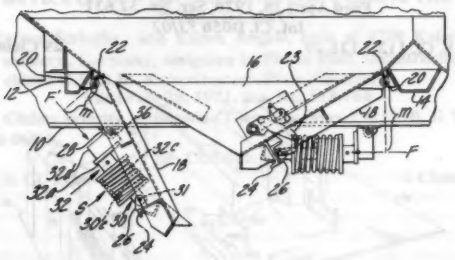
A wear plate is provided for the sloping friction face of a railway car bolster, the wear plate being held in operative position by the spring which urges a friction wedge toward the bolster and a vertical friction face of a railway car side frame.

3,712,248

SPRING LOADED RAILWAY HOPPER CAR DOOR

Walter L. Floehr, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed July 21, 1970, Ser. No. 56,927
Int. Cl. B61d 7/18, 7/26, 43/00
U.S. Cl. 105—253 5 Claims



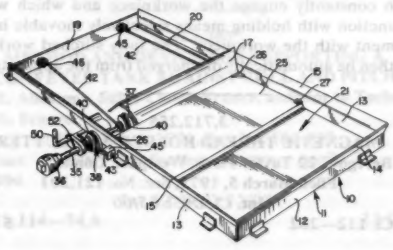
A hopper door of the bottom opening type for a railway hopper car is spring loaded to assist in closing the door. The spring reacts between and is guided by telescoping shaft and cylinder members pivotally connected to the car body and door, respectively. The pivotal connection between the cylinder member and the car body is offset from the longitudinal axis of the spring so that a closing force is applied to the door by the spring when the door is in open position.

3,712,249

FLEXIBLE RAILWAY HOPPER CLOSURE OPERATING MECHANISM

Ernest J. Nagy, and William R. Shaver, both of Munster, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 801,634, Feb. 24, 1969, abandoned. This application May 20, 1970, Ser. No. 39,682
Int. Cl. B61d 7/20, 7/26; B65h 75/18
U.S. Cl. 105—282 R 15 Claims



A hopper discharge outlet arrangement including a frame and a sectional closure member slidingly movable horizontally relative to a hopper discharge opening, the closure member being moved by the rotation of an operating rod having reels connected thereto on which flexible members are wound and unwound and are so anchored and positioned on the frame that in response to rotation of the reels the closure member is moved between open and closed positions.

Certain of the reels are provided with a spiral groove on which the flexible members are wound, the initial winding taking place on the smallest diameter portion of the groove and subsequent winding occurring on increased diameter groove portions of the total groove which in effect provides a high torque and low speed initial operation during the opening of the gate and which upon continued opening provides for a decrease in torque and a higher speed of opening.

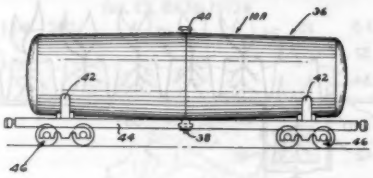
A modification of the invention includes reels in the form of pulleys and flexible elements comprise chains which are wound around the pulleys and upon themselves so as to achieve the desired torque and speed operation.

3,712,250

TANK STRUCTURE

Wallace T. Geyer, Des Peres, Mo., and Robert W. Randolph, St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 794,920, Jan. 29, 1969, Pat. No. 3,540,115. This application May 14, 1970, Ser. No. 48,730
Int. Cl. B61d 5/00
U.S. Cl. 105—360 4 Claims



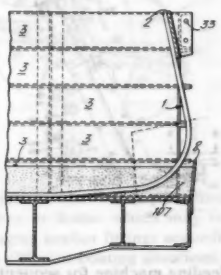
An elongate tank structure having a sloping bottom to provide adequate drainage of liquids, and the method of making same. The tank structure comprises elliptical end heads having their major axes extending in a horizontal direction and a circular center portion, with the tank shell changing its shape gradually from the elliptical heads to the circular center and the tank bottom sloping gradually downwardly from the end heads to the center. The tank structure is formed by welding end heads of an elliptical shape to an open ended cylindrical tank shell which has been deformed at its ends to match the elliptical end heads. The enclosed tank structure thus formed is pressurized to an internal pressure exceeding the yield of the material from which the tank shell is formed, while the end heads are held against any deformation. The tank shell is thereby deformed by the internal fluid pressure into a circular center portion with the tank portion between the elliptical end heads and the center having a bottom which slopes gradually downwardly.

3,712,251

RAILWAY CAR WITH ELASTIC SIDE WALLS

Alberto Moretti, and Settimio Feroli, both of Taranto, Italy, assignors to Italsider S.p.A., Genoa, Italy

Filed July 17, 1970, Ser. No. 55,801
Claims priority, application Italy, Aug. 7, 1969, 7238 A/69
Int. Cl. B61d 17/08
U.S. Cl. 105—409 5 Claims



A railway car with elastic side walls for carrying crops and discards coming from cutting of flat bloom ends by a slabbing mills, which crops and discards are collected by a movable box container which collects and carries said materials and then discharges them onto a special railway car.

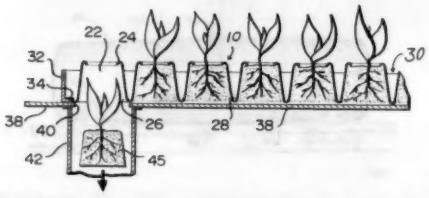
ERRATUM

For Class 108—46 see:
Patent No. 3,712,235

3,712,252
SEEDLING GROWING AND HANDLING DEVICE

Barney K. Huang, Raleigh, N.C., assignor to Research Corporation, New York, N.Y.

Filed Nov. 6, 1970, Ser. No. 87,558
Int. Cl. A01c *11/02*
U.S. Cl. 111—2 1 Claim

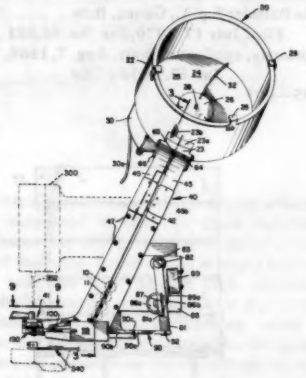


A seedling growing and handling device is provided and includes a tray-like structure consisting of a continuous sheet of material formed into a multiplicity of seed growth zones; each of the zones comprising a single confining wall defined by a hollow open ended truncated cone; and a web of the material of the sheet joining the lower larger diameter ends thereof into a continuous structure such that seedlings grown in the zone may be readily removed from the lower larger diameter ends with a minimum disturbance of the plants. The invention also contemplates the automatic transplanting of the seedlings from the device.

3,712,253
BUTTON FEEDING MACHINE

Floyd Asnes, 41-65 Westmoreland Street, Little Neck, N.Y.

Division of Ser. No. 692,909, Dec. 22, 1967, Pat. No. 3,565,285. This application Jan. 25, 1971, Ser. No. 109,391
Int. Cl. D05b *3/22*
U.S. Cl. 112—113 4 Claims

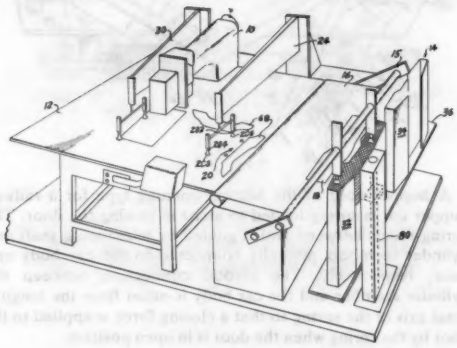


A button-feeding machine for sequentially feeding buttons located in a hopper through a chute to a holder in which the buttons are held in proper position for attachment to a cloth article by a sewing needle. The buttons are supplied in bulk to a hopper where they are oriented and aligned in a chute and then positively fed from the chute to the holder, one at a time by a ram arm whose actuation is controlled by a machine operator. A shoe is provided at the outlet of the chute to hold the ejected button in the proper orientation for sewing.

3,712,254
APPARATUS AND METHOD FOR EDGE STITCHING/BINDING WORKPIECES

Bernard D. Beamish, and David G. Taylor, both of 3289 Lenworth Drive Unit F, Cooksville, Ontario, Canada

Filed April 28, 1970, Ser. No. 32,631
Int. Cl. D05b *33/02*
U.S. Cl. 112—121.29 29 Claims

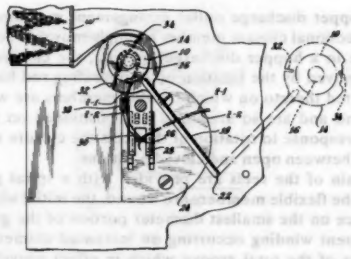


An apparatus and method for the edge stitching/binding of fabric workpieces in which the workpieces are introduced into a sewing machine at a speed synchronous with that of the sewing machine and in a precise orientation relative to the needle thereof. The workpieces optionally have a tape folded about the edge thereof and are automatically fully stitched at a substantially uniform distance from the edge thereof, whereafter the workpieces are severed into separate entities. During the stitching operation each workpiece is caused to traverse a stitch pattern which consists of a random sequence of straight lines, concave and convex curved portions, by control means which constantly engage the workpiece and which work in conjunction with holding means selectively movable into engagement with the workpiece. The fully stitched workpieces may then be automatically discharged from the apparatus.

3,712,255
MAGNETIC THREAD HOLDER AND CUTTER

Alex Beregow, 22 Taylor Place, Westport, Conn.

Filed March 5, 1971, Ser. No. 121,301
Int. Cl. D05b *65/00*
U.S. Cl. 112—252 5 Claims



A thread holder and cutter for mounting on a sewing machine comprises a pair of magnets disposed on opposite sides of an intermediate metal base member and movable toward and away from the base member sufficiently to permit

a pair of threads to be inserted between each of them and the base member. The latter is wider than the magnets and has in its periphery a pair of oppositely disposed reentry slots through one of which the threads are lead from one side of the base member to the other and to the opposite slot which is provided with a cutting edge.

3,712,256

DEVICE ON SEWING MACHINES FOR GUIDING THE THREAD CHAIN

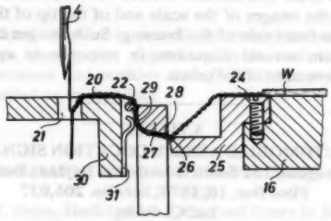
Werner Striegler, and Eugen Angele, both of 6750 Kaiserslautern, Germany, assignors to Firma Pfaff Industriemaschinen G.M.B.H., Kaiserslautern/Pfalz, Germany

Filed Feb. 25, 1971, Ser. No. 118,764

Claims priority, application Germany, May 29, 1970, G 70 20 068.9

Int. Cl. D05b *65/00*

U.S. Cl. 112—252 6 Claims



Guiding means for the thread chain between successive work blanks on sewing machines having a work clamp that is displaceable on the work plate relative to the reciprocating needle, a cutting device and a clamp for the thread chain, where a thread chain engaging member is provided which is movably disposed and driven between an initial position proximate the stitch hole and a final guiding position located at a distance therefrom. The thread chain engaging member by its movement toward the final guiding position is in thread chain tensioning engagement with the part of the thread chain disposed between the stitch hole and the clamping location.

3,712,257

METHOD AND DEVICE FOR SUPPORTING A CONVEYED TANK AGAINST ROLL AND PITCH

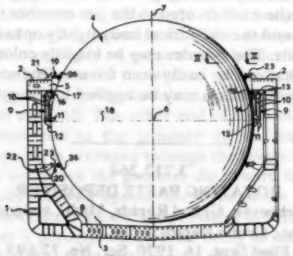
Jean H. Alleaume, Saint-Cloud, France, assignor to Technigaz, Paris, France

Filed Jan. 6, 1971, Ser. No. 104,239

Claims priority, application France, April 30, 1970, 7016004

Int. Cl. B63b *25/08*

U.S. Cl. 114—74 A 12 Claims



A method of compensating by means of external bearing reactions for the roll and pitch forces, a rigid ship-borne tank movably suspended at discrete external points distributed along the periphery of the said tank and consisting in applying said bearing reactions, without creating any normal effect, onto said tank at discrete points along the tank periphery located in a same horizontal plane so as to be horizontal relative to said ship by being each parallel with the local plane tangent to the tank perpendicularly to the normal passing through the point of application of the bearing reaction considered.

3,712,258

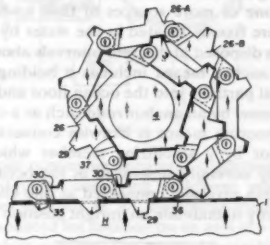
ROLLBACK CLOSURE FOR TIGHTLY SEALING OPENINGS ESPECIALLY OF SHIPS

Ralf Bauer, Warnemunde; Wilfred Lorenz, Rostock; Udo Rohr, Rostock, and Friedrich Silge, Rostock, all of Germany, assignors to Veb Warnowwerft Warnemunde, Warnemunde, Germany

Filed March 12, 1971, Ser. No. 123,640

Int. Cl. B63b *19/20*

U.S. Cl. 114—202 6 Claims



Hatch closure consisting of a series of uniform closure elements. Each closure element has, fastened to each end thereof, a linkage member so designed that, pursuant to rolling back, the weight of the rolled back closure portion rests on the linkage members and their supports, and not on the body or gaskets of the closure elements.

3,712,259

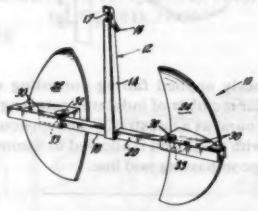
ADJUSTABLE ANCHOR

Walter J. Semolic, 406 Bee Street, Meriden, Conn.

Filed May 18, 1970, Ser. No. 37,966

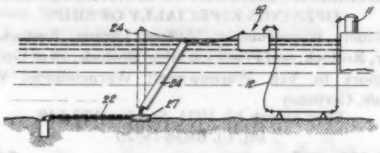
Int. Cl. B36b *21/34*

U.S. Cl. 114—207 1 Claim



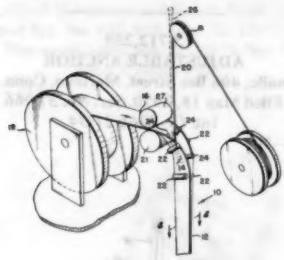
An adjustable anchor ensemble is disclosed, including a main anchor member or frame which may receive one of several ground engaging anchor fittings according to anchoring requirements in different boating situations. Illustratively, the anchor frame may be fitted with fluke-type ground engaging members. Each kind of ground engaging member may be variously positioned on the anchor frame to achieve the most favorable anchoring conditions or to drag the anchor along the bottom. The anchor may be folded into collapsed condition for ease of stowage in a boat.

3,712,260
MARINE TERMINAL MOORING
George E. Mott, Metairie, and John T. Loggins, New Orleans, both of La., assignors to Texaco, Inc., New York, N.Y.
Filed Nov. 14, 1969, Ser. No. 876,926
Int. Cl. B63b 21/00
U.S. Cl. 114—230 3 Claims



The invention relates to a marine terminal positioned at or adjacent to an offshore body of water being adapted for anchoring barges, vessels and the like while the latter are connected with one or more sources of fluid to be transferred. Said vessels are fixedly located in the water by a plurality of anchor means disposed at discrete intervals about the floating vessel. Each anchor means includes a holding member imbedded at least partially into the ocean floor and connected to the floating vessel by an anchor rode such as a chain, cable or the like. A mooring means is likewise connected to the imbedded anchor by a stabilizing member which includes a weighted body normally supported at the ocean floor and a buoyant column pivotally connected at one end to the body buoyed whereby to maintain an upright position.

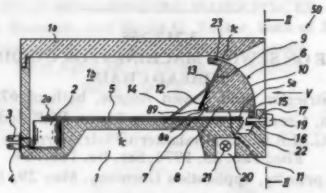
3,712,261
FAIRING
Jack I. McLelland, Palos Verdes Peninsula, and Theodore F. Mangels, Newport Beach, both of Calif., assignors to Ocean Science and Engineering Inc., Washington, D.C.
Filed April 1, 1971, Ser. No. 130,374
Int. Cl. B63b 21/00
U.S. Cl. 114—235 F 12 Claims



A continuously applied fairing consisting of a preformed resilient tubular member of indeterminate length which can be opened and wound as a flat strip. When unwound, it is fed into engagement with a line and is allowed to assume its normal tubular shape encompassing said line.

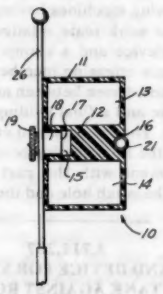
3,712,262
INDICATING INSTRUMENT WITH PIVOTABLE SCALES
Willy Kisselmann, Grunwald, near Munich; Fritz Rumpelein, Munich, and Paul Kopf, Unterhaching, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed April 10, 1970, Ser. No. 27,262
Claims priority, application Germany, April 21, 1969, P 19 20 185.5
Int. Cl. G09f 9/00
U.S. Cl. 116—129 R 15 Claims

An indicating instrument wherein a flat block-shaped housing consisting of light diffusing material accommodates a moving-coil instrument having a pivotable pointer whose tip travels along an arcuate path extending lengthwise of the front side of the housing and adjacent to one flat surface of an elongated prism which is pivotable about an axis extending at right angles to and crossing in space with the pivot axis of the



pointer. At least the one surface of the prism carries a straight graduated scale and another surface of the prism is mirrored to reflect the images of the scale and of the tip of the pointer toward the front side of the housing. Such images can be observed from several directions in response to appropriate pivotal movement of the prism.

3,712,263
AUTOMOBILE AERIAL LOCATION SIGNAL
Ernest Faragosa, 132 South Grandview, Daytona Beach, Fla.
Filed Dec. 10, 1971, Ser. No. 206,037
Int. Cl. B60q
U.S. Cl. 116—28 3 Claims

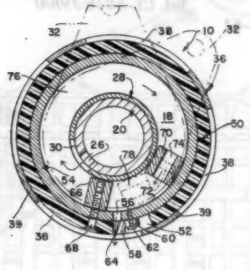


An automobile aerial attached location signal for identifying and locating a particular automobile when parked on large crowded parking lots. The signal device consists of a brightly colored cylinder having an aperture on one side thereof and a slotted clamping jaw which encompasses the automobile aerial and engages in the aperture. A coil spring extends around the cylindrical body and engages in an annular groove therein with its opposite ends secured to the jaw member to clamp the jaw member and the cylindrical body tightly onto the aerial of the automobile. The cylinder may be brightly colored and is of a size such that can be easily seen from a distance. Initials or other identifying indicia may be applied to the cylinder when desired.

3,712,264
ROTATING PASTE DEPOSITER
Albert F. Verhoeven, Grand Rapids, Mich., assignor to Werner Lehara, Inc., Grand Rapids, Mich.
Filed Sept. 16, 1970, Ser. No. 72,693
Int. Cl. B05c 5/02
U.S. Cl. 118—25 9 Claims

In a rotating paste depositer having an outer rotating cylinder with a plurality of cutouts forming outlets for depositing a fluid or pasty-like material on a comestible product, the outer cylinder rotates around a series of fixed inner cylinders

having valves for control of the flow rate of the material to be deposited and having an inner chamber to equalize the pressure at the outlets. In the preferred form a secondary pressure means is contained within the inner chamber and rotates



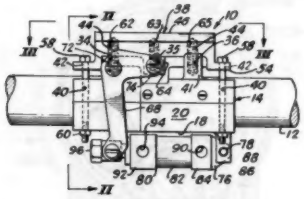
around a fixed cylinder to provide increased pressure at the outlet ports during the depositing cycle and to provide reduced pressure and positive shutoff when the material has been deposited on the product.

3,712,265

RETRACTABLE GUMMER DIE FOR ENVELOPE MACHINES

Herbert W. Helm, Hollidaysburg, Pa., and Henry D. Barthalow, East Freedom, Pa., assignors to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Filed Sept. 3, 1970, Ser. No. 69,338
Int. Cl. B05c *1/02*
U.S. Cl. 118—212 **8 Claims**



Apparatus for applying adhesive to an envelope blank includes a rotatably mounted shaft with an adhesive applicator assembly secured thereto. The applicator assembly has a body portion of generally rectangular configuration with a bottom wall, pairs of side walls and a top wall. An air actuated piston cylinder assembly is mounted on the bottom wall of the body portion substantially parallel to the axis of the rotatable shaft. A pair of L-shaped levers are pivotally secured intermediate their end portions to the side walls of the body portion and have one end portion connected to the rod portion of the piston cylinder assembly. A gummer die holder is mounted in overlying relation with the top wall of the body portion and is resiliently urged by spring members radially away from the body portion top wall. The other end of each of the levers is pivotally connected to the gummer die so that the piston cylinder assembly is arranged through the levers to retract the gummer die and move the gummer die toward the applicator assembly body top wall against the force of the spring members. Suitable control means are provided to supply air to the cylinder after a predetermined time delay to thereby retract the gummer die holder and prevent the gummer die holder from transferring adhesive to the back-up rolls.

In one embodiment, the spring members are positioned around the bolts that secure the gummer die holder to the body portion and channel-shaped guide members are provided on the gummer die holder that extends around the bolts extending upwardly from the body portion.

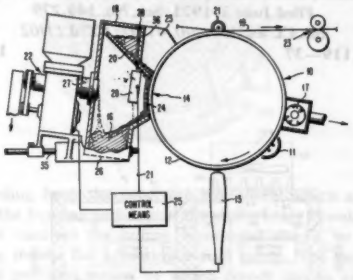
In another embodiment, the spring members are positioned in aligned spring receiver bores in the top wall of the applicator body portion and the bottom wall of the gummer die holder.

3,712,266

DEVELOPER CONVEYING APPARATUS

Russell A. Stauffer, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 27, 1971, Ser. No. 173,516
Int. Cl. G03g *13/00*
U.S. Cl. 118—636 **12 Claims**



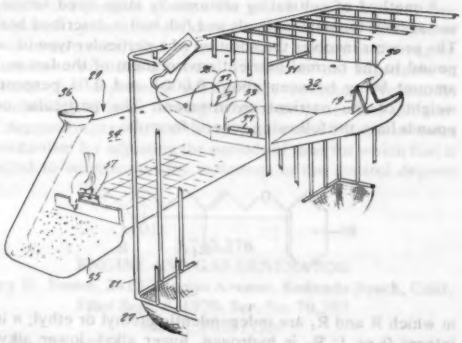
The developer conveying apparatus comprises a drum and magnet assembly for conveying developer material to the photoconductor surface of an electrophotographic printer. The drum is mounted for rotation on an axis at a right angle to the photoconductor drum. The magnet assembly is mounted in close proximity radially to the carousel drum to produce a magnetic field pattern parallel to the rotational direction of the drum. The developer material is moved into the magnetic field as the carousel drum is rotated so that the developer material adheres to the inner surface of the drum and is conveyed to an inclined chute located within the upper portion of the drum. The developer material moves beyond the magnetic field and drops to the inclined chute. The material cascades down the chute and enters a development zone where it passes through a restricted path between a development electrode and a photoconductor to develop the electrostatic images on the photoconductor. The developer material then returns to the bottom of the carousel drum where it is enriched with toner and the cycle is repeated as long as image development is required.

3,712,267

BIRD FEEDER

Samuel S. Moliterni, 331 South Avenue, Garwood, N.J.

Filed March 16, 1971, Ser. No. 124,813
Int. Cl. A01k *39/00*
U.S. Cl. 119—18 **2 Claims**



A feeder attachable to a bird cage and into which birds may enter for feeding, the device comprising a transparent plastic,

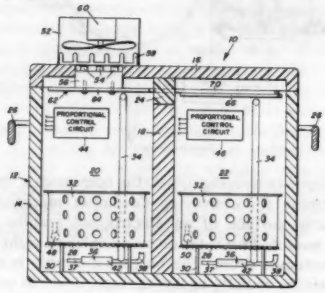
long enclosure with an entrance doorway at one end and a removable food tray at the opposite end, so to prevent the food from being scattered upon the floor of the bird cage or outward from the cage.

3,712,268

PORTABLE BACTERIOLOGICAL INCUBATOR

Jack P. Reed, 2-808 Borinquen Towers, San Juan, P.R.

Filed June 2, 1971, Ser. No. 149,279
Int. Cl. A01k *41/00, 41/02*; F27d *11/02*
U.S. Cl. 119—37 **11 Claims**



A portable incubator with two independent compartments for regulating the temperature and humidity of bacteriological and biochemical specimens. Simultaneous heating and cooling enables variable incubation temperature control over a wide range of outside ambient temperatures. Simplified solid-state circuitry provides stable operation within precision temperature limits.

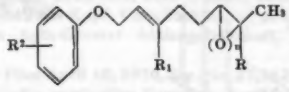
3,712,269

CULTIVATION OF LARGE SIZED LARVAE

Peter E. Letchworth, Palo Alto, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Oct. 1, 1971, Ser. No. 185,852
Int. Cl. A01k *67/00*; A23k *1/00*
U.S. Cl. 119—51 **2 Claims**

A method of cultivating abnormally large sized larvae for use as food for small animals and fish bait is described herein. The process involves the addition of a particular type of compound to the normal nutrient environment of the larvae, the amount being between about 0.0001 and 0.01 percent by weight of the nutrient environment. The particular compounds have the following generic formula:



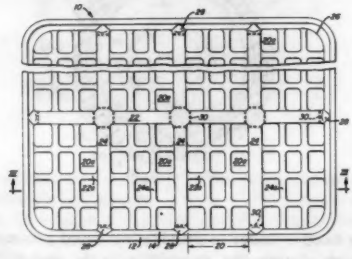
in which R and R_1 are independently methyl or ethyl; *n* is an integer 0 or 1; R_2 is hydrogen, lower alkyl, lower alkynyl, lower alkoxy, halogen, nitro, lower alkyl thio, or certain heterocyclic radicals.

3,712,270

CHICK FEEDER LID STRUCTURES

Edward J. Fier, Jr., 572 Killarney Pass, Mundelein, Ill., assignor to United States Steel Corporation

Filed Dec. 31, 1970, Ser. No. 103,082
Int. Cl. A01k *39/00*
U.S. Cl. 119—61 **5 Claims**



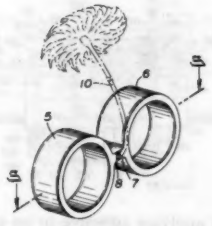
A feeder lid for chicks is provided in the form of a deep dish having ribs throughout its bottom.

3,712,271

TOE HOLDER

Russell E. Greathouse, 872 North Medina Line Road, Cuyahoga Falls, Ohio

Filed May 10, 1971, Ser. No. 141,812
Int. Cl. A01k *29/00*; A61p *5/00, 13/00*
U.S. Cl. 119—96 **4 Claims**



In sunbathing or the like, a bather's feet are held together by means which encircles the large toes or some other portions of each foot of the bather, which portion is adjacent the bather's toes. Without such a toe holder, a person's feet naturally spread apart so that the sun acts to a greater extent on the inner portions of the legs than the outer portions.

3,712,272

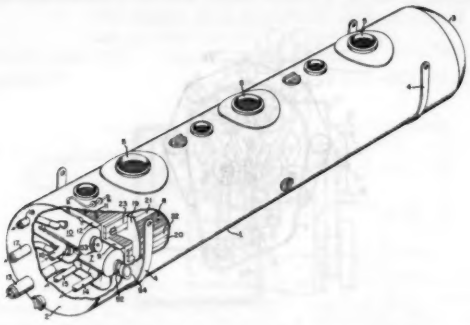
COMBINED MOISTURE SEPARATOR AND REHEATER

Theodore C. Carnavos, Danbury, Conn.; William S. Hubble, and Kenneth K. Woods, both of Cape Elizabeth, Maine, assignors to General Electric Company

Filed Oct. 19, 1971, Ser. No. 190,538
Int. Cl. F22g *1/00*
U.S. Cl. 122—483 **5 Claims**

A combined moisture separator and reheater for a steam turbine-generator power plant has moisture separating elements and first- and second-stage heating elements disposed longitudinally in a pressure-tight cylindrical shell. The reheating elements each comprise a transverse header with a vertical partition, the tube sheets forming part of the header wall. Tube bundles designed to be supplied with substantially saturated steam are comprised of tubes extending the length of the

pressure vessel from one side of the header, forming a U-bend at the opposite end in a horizontal plane and extending back



to the other side of the header. The tube bundles are supported on side rails which are arranged to slide on side rails supported by the pressure shell.

3,712,273

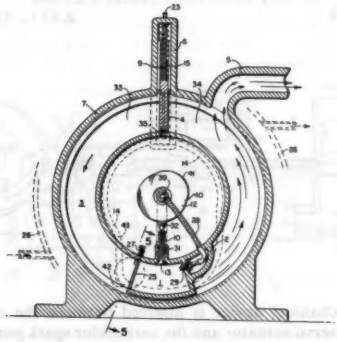
INTERNAL COMBUSTION ROTARY ENGINE

Ernest G. Thomas, P.O. Box 1013, Magnolia, Ark.

Filed Nov. 17, 1971, Ser. No. 199,573

Int. Cl. F02b *55/14*

U.S. Cl. 123—8.47 **3 Claims**



An internal combustion engine of the rotary type wherein the fuel is injected into the piston chamber through a valve in the piston head, creating the normal expansion propulsion forces resulting from the explosion of compressed hydrocarbon gases. The piston head itself rotates with a spring-biased plate closing the chamber during the fuel injection phase but blowing open upon the explosion of the fuel, producing a jetting effect, causing the piston head to recoil and rotate producing motive force.

3,712,274

ROTARY INTERNAL COMBUSTION ENGINE

Leonard F. Craft, Box 876, Andrews, Tex.

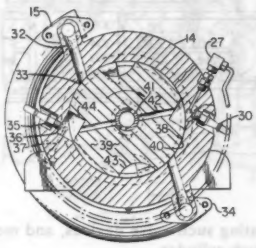
Filed April 6, 1972, Ser. No. 241,648

Int. Cl. F02b *53/04*

U.S. Cl. 123—8.49 **10 Claims**

A rotary internal combustion engine having a rotor journaled within a housing with a portion of the housing and rotor cooperating together to jointly form a combustion chamber which is brought into alignment each time the rotor is rotatably moved a specified angular amount relative to the housing depending upon the configuration of the combustion chambers located in the rotor and housing.

The combustion chamber is charged with air through a hollow sleeve which is received within the rotor. The sleeve and rotor are each provided with passageways which are indexed with one another so that flow occurs when the combustion chamber of the rotor and housing are aligned with one another.



Depending from the rotor are two shafts which are journaled to the housing with one of the shafts being counterbored so that it receives the before mentioned sleeve, as well as providing means for actuating a fuel pump. The remaining shaft end provides means by which power can be extracted from the engine.

3,712,275

FUEL INJECTION SYSTEMS

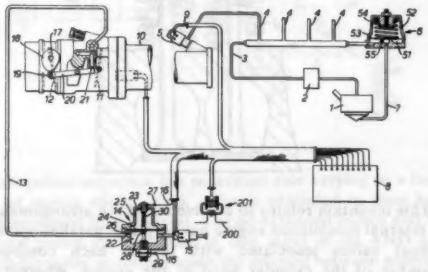
Harold Ernest Jackson, Elburton, England, assignor to Petrol Injection Limited, Plymouth, Devon, England

Filed May 24, 1971, Ser. No. 146,135

Claims priority, application Great Britain, May 26, 1970, 25,304/70; Feb. 26, 1971, 5,550/71

Int. Cl. F02m *51/00*

U.S. Cl. 123—32 EA **42 Claims**



A fuel injection system which injects fuel intermittently and in which the periods of time for which fuel is injected are determined by the rate of flow of a control fluid. This rate of flow is in turn controlled by an air valve located in the engine air intake to produce a control depression and adjustable to maintain that depression substantially constant. Preferably, the control fluid is air flowing from atmosphere into the control depression region, and the system preferably also includes a mechanism for adjusting the periods of time for which fuel is injected to compensate for variations in the control depression.

3,712,276

ENGINE AND GAS GENERATOR

Berry W. Foster, 2415 Thomas Avenue, Redondo Beach, Calif.

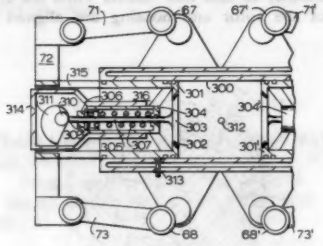
Filed Sept. 8, 1970, Ser. No. 70,387

Int. Cl. F02i *11/00*

U.S. Cl. 123—47 R **29 Claims**

A two-cycle piston-cylinder combination which acts as an engine to provide shaft power or, alternatively, as a gas

generator to provide turbine power. There are valve devices for maintaining hot gases out of contact with lubricants,



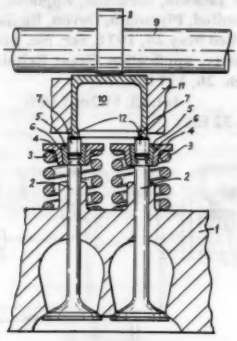
means for actuating such valve devices, and means for combusting fuel in such cylinder.

3,712,277

VALVE ACTUATING ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

Sanzio Pio Vincenzo Piatti, 14, Corso Porta Nuova, Milan, Italy

Filed March 16, 1971, Ser. No. 124,776
Claims priority, application Italy, Mar. 24, 1970, 22338-A/70
Int. Cl. F011 *1/26*
U.S. Cl. 123—90.22 **6 Claims**



This invention relates to a valve actuating arrangement for an internal combustion engine having plural parallel-operating poppet valves associated with the or each combustion chamber of the cylinder head of the engine, wherein said valves are actuated by a common cam via a common tappet, cooperating with, and interposed between, the cam and the valves. The tappet is tubular and has a transverse wall closing one end, which is engaged by a cam. The rim, at the open end of the tubular member, engages the parallel valves.

3,712,278

ROCKER-ARM ASSEMBLY FOR INTERNAL COMBUSTION ENGINES

Karl Walter Kuhn, Saint-Germain-en-Laye, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed Oct. 20, 1971, Ser. No. 190,990
Claims priority, application France, Nov. 27, 1970, 7042648
Int. Cl. F011 *1/18, 1/26*
U.S. Cl. 123—90.39 **11 Claims**

A valve-operating rocker-arm for internal combustion engines at least partially displaceable or deformable selectively from its operative position in its mounted condition on the engine without any removal, so as to move at least its portion co-operating with at least one valve away from the clearing space and the path of travel for taking each associated valve out

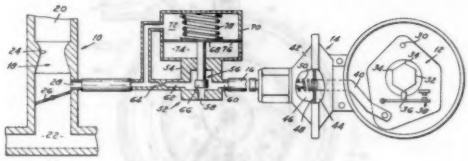
when removing same, releasable locking means being provided to prevent such a displacement or deformation in normal service or use.

3,712,279

VACUUM SPARK ADVANCE CUTOFF

Richard D. Vartanian, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 2, 1970, Ser. No. 94,362
Int. Cl. F02p *5/06*
U.S. Cl. 123—117 A **5 Claims**



A mechanical device is inserted between the engine distributor servo actuator and the carburetor spark port comprising an atmospheric air bleed controlled by changes in vacuum level in the spark port during vehicle accelerations from an engine idle speed or any speed without spark port vacuum; the bleed immediately moving the spark timing to a maximum retard position. The device consists of a valve to open and close an air vent in response to a power actuator connected to the spark port and having an orifice interconnecting abutting chambers of the power device.

3,712,280

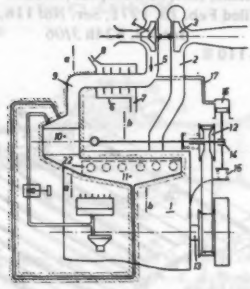
ADMISSION CIRCUITS OF DIESEL ENGINES

Maurice G. Brille, 27, rue Parmentier, 92 Nanterre, and Yves M. Baguelin, 9, rue Andre' Dumas, 78 Marly-le-rol, both of France

Filed Nov. 2, 1970, Ser. No. 86,229
Claims priority, application France, Oct. 31, 1969, 6937527
Int. Cl. F02b *37/04*
U.S. Cl. 123—119 CB **7 Claims**

An improved Diesel engine supercharged by a turbo-compressor and corrected by a volumetric compressor corrector device driven from the engine crank shaft at a speed ratio which increases as the pressure delivered by the centrifugal compressor diminishes, in which an exchanger of heat with the cooling liquid of the engine is provided between the turbo-

compressor and the volumetric corrector device, and in which the portion of the admission circuit comprised between the



heat exchanger and the engine is provided with a heat and sound-insulation system.

3,712,281

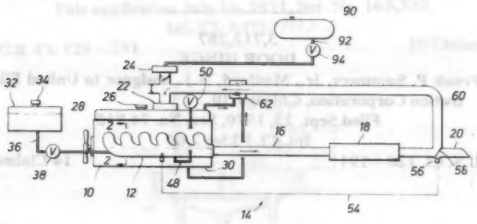
INTERNAL COMBUSTION ENGINE INCORPORATING MODIFICATION TO REDUCE POLLUTION IN EXHAUST THEREFROM

Arthur P. Ruth, Houston, Tex., assignor to Dalton L. Smith, a part interest

Filed March 23, 1971, Ser. No. 127,257

Int. Cl. F02m *25/06*; F02b *47/10*

U.S. Cl. 123—119 A **14 Claims**



An internal combustion engine which includes certain modifications to reduce the pollution thereof. The exhaust stream from the exhaust manifold of the engine is returned in part or in whole, subject to the control of a valve means, for recycling through the carberator. Dependent upon the loading of the engine, a variable supply of oxygen is interjected at the carberator to enhance the extent of combustion and thereby reduce the non-combusted hydrocarbon gases. Recirculation is further accompanied by the injection of steam at the carberator to slightly cool the gases drawn into the internal combustion engine, thereby increasing the compression and tending to improve the extent of combustion within the engine.

3,712,282

TEMPERATURE CONTROL SYSTEM FOR SUPERCHARGED INTERNAL COMBUSTION ENGINE

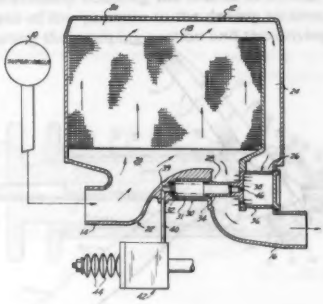
Walter F. Isley, Grosse Pointe, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jan. 22, 1971, Ser. No. 108,736

Int. Cl. F02b *37/04*

U.S. Cl. 123—119 CD **6 Claims**

A temperature control system for a supercharged internal combustion engine in which the supercharger is activated by the engine. The system regulates the temperature of the air fed to the engine induction manifold by providing a selective



bypass of air around the cooling unit responsive to ambient air temperature and to the level of pressure in the manifold.

3,712,283

SAFETY ARRANGEMENT FOR STARTING MOTOR IN INTERNAL COMBUSTION ENGINES

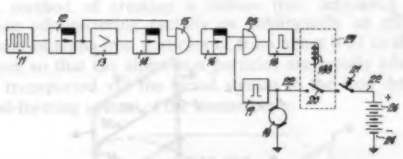
Albert Kiess, 7254 Munchingen; Peter Gunsser, 7 Stuttgart 1, and Edgar Kuhn, 7016 Gerlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 7, 1971, Ser. No. 178,288

Claims priority, application Germany, Sept. 10, 1970, P 20 44 783.0

Int. Cl. F02n *17/00*

U.S. Cl. 123—179 A **16 Claims**



First pulses sequence has repetition rate varying as a function of engine speed. Each pulse is extended in time by a predetermined time interval. The so-extended pulses and the original pulses each applied at one input of an AND gate which furnishes an output when the interval between pulses of the pulse sequence is shorter than the predetermined time interval. Output of AND gate de-energizes starting motor. Starting motor also de-energized for a predetermined time period following de-energization. regardless of speed of engine.

3,712,284

BRICKLAYER'S HAMMER HEAD HAVING WEAR-RESISTANT CHIPPING END SURFACES

Laurence W. Porter, Hebron, Ill., assignor to Vaughan & Bushnell Mfg. Co., Hebron, Ill.

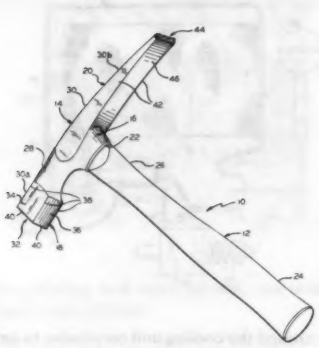
Continuation of Ser. No. 876,299, Nov. 13, 1969. This application Oct. 12, 1971, Ser. No. 188,032

Int. Cl. B28d *1/26*

U.S. Cl. 125—40 **1 Claim**

A forged steel bricklayer's hammer head including a blade portion having a chipping end defined by top and bottom bevel faces intersecting along a straight transverse cutting edge and by opposite lateral edges of the blade portion is provided with a layer of tungsten carbide electrodeposited on said chipping end at each of the bevel faces adjacent the cutting

edge therealong and at each of the lateral edges adjacent the cutting edge, the layers forming outer surfaces on the bevel



faces and the lateral edges and penetrating the blade portion, thereby providing wear-resistant surfaces on said chipping end.

3,712,285

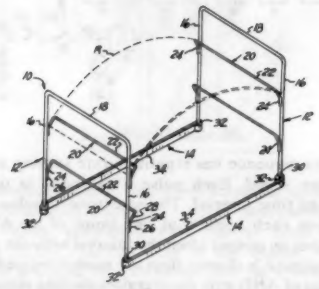
METAL FOIL REFLECTOR HOLDER FOR COOKING GRILLS

Ernest Copeland, 7601 South Silver Road, Marine City, Mich.

Filed Oct. 19, 1971, Ser. No. 190,488

Int. Cl. A47j *37/00*; F24c *1/16*

U.S. Cl. 126—9 R **7 Claims**



A pair of inverted U-shaped frames are disposed in horizontally-spaced parallel relationship by connecting bars at their lower ends. Each frame is provided with at least one cross bar having downwardly-inclined arms secured to the frame. A panel of flexible metal foil, such as aluminum foil, of sufficient stiffness to be self-sustaining,is arched between opposing cross bars of the same height. The holder is then placed over the grill or other cooking device above the heating means and above the article being cooked so as to reflect downward upon the food article being cooked the heat rising from the hot coals, charcoal or electrical heating unit of the cooking device. The lower ends of the frame are preferably pivoted to their respective connecting bars so as to enable the reflector holder to be folded flat substantially into one plane for storage or transportation.

3,712,286

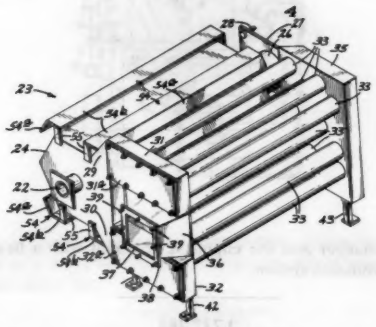
GAS OR OIL FIRED HEAT EXCHANGER FOR FORCED AIR HEATING UNIT

Charles E. Nelson, Excelsior, Minn., assignor to Environmental Control Systems, Inc., Minneapolis, Minn.

Filed Feb. 18, 1971, Ser. No. 116,306

Int. Cl. F24h *3/06*

U.S. Cl. 126—110 B **7 Claims**



A heat exchanger is shown having an elongated combustion chamber with a burner opening in one end thereof and a pair of ducts leading from the other end to a pair of separate headers. Two groups of tubes extend from the two headers along the combustion chamber for connection with a common header, and a third group of tubes extend back from the common header to a combustion gas discharge header positioned between the first two headers, but separate therefrom.

3,712,287

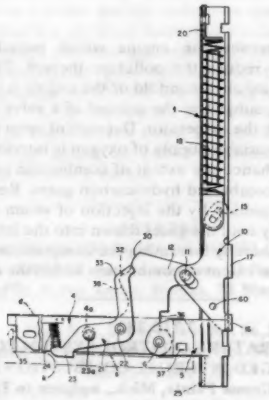
DOOR HINGE

Frank P. Summers, Jr., Medford, N.J., assignor to United Filtration Corporation, Chicago, Ill.

Filed Sept. 23, 1970, Ser. No. 74,815

Int. Cl. F23m *7/00*

U.S. Cl. 126—191 **14 Claims**



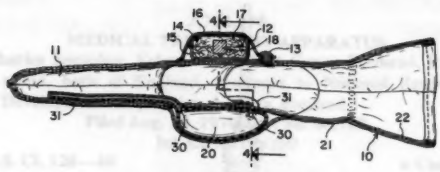
A structure especially useful as an oven door hinge comprising a spring which is self-contained within a casing and a lever system which compresses the spring upon opening of the door to develop a torque for counterbalancing.

3,712,288

HEATED ARTICLE OF APPAREL

Efram I. Weiss, 31 West 60th Street, New York, N.Y.

Filed June 3, 1971, Ser. No. 149,538
Int. Cl. A61f 7/06
U.S. Cl. 126—206 4 Claims



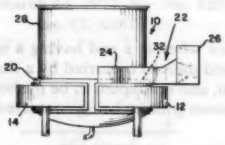
An article of apparel, preferably in the form of a glove with fingers, has a pocket on the back thereof, a combustible tablet within an air-permeable container is disposed within the pocket, a tubular conduit extends from the pocket, around to the palm portion of the glove, a flexible, resilient pump or bladder is disposed in said palm portion and said conduit is connected to the input portion of the bladder. The bladder has either output openings or elongated hollow output fingers for directing heated air arriving from the conduit, toward and into the fingers of the glove for heating them. The bladder is manually operated by one or more repeated squeezes of the user's hand when said finger heat is desired.

3,712,289

DEEP FAT FRYER

Edward A. Reid, Jr., and William F. Morse, both of Columbus, Ohio, assignors to Columbia Gas System Service Corporation, New York, N.Y.

Division of Ser. No. 10,126, Feb. 10, 1970, Pat. No. 3,671,174.
This application July 16, 1971, Ser. No. 163,332
Int. Cl. A47j 37/12
U.S. Cl. 126—391 10 Claims



A deep fat frying unit having a glass cooking vessel adapted to hold a supply of cooking oil. The unit is heated by an annular infrared radiant gas burner assembly which heats the oil primarily by infrared radiation passing from the burner assembly directly through the vessel wall. The burner assembly is above the bottom of the vessel so that there is a cool zone at the bottom of the vessel which eliminates burning food sediment deposited therein. The radiant heat is absorbed by the oil in an annular zone adjacent the vessel wall and this produces oil circulation by convection upwardly along the wall and downwardly at the center of the vessel, but without overheating the oil.

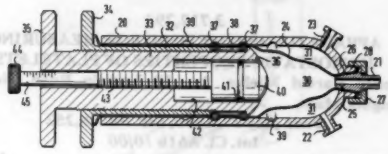
3,712,290

APPARATUS FOR INTRA-AORTAL BALLOON PULSATION

Werner Irnich, Reimser Str. 48, and Walter Bleifeld, Eupener Str. 185, both of Aachen, Germany

Filed Sept. 30, 1971, Ser. No. 185,230
Claims priority, application Germany, Oct. 10, 1970, P 20 49 959.6
Int. Cl. A61b 19/00; A61m 1/00
U.S. Cl. 128—1 D 22 Claims

An apparatus for aiding the heart in its pulsation wherein a balloon means is inserted into the aorta and which is inflated and deflated in accordance with the diastolic and systolic cycles of the heart comprising a chamber having a pumping section connected with the balloon, and a driving section, a source of excess pressure and a source of low pressure, control means for alternately coupling the source of excess pressure and the source of low pressure to the driving section, a membrane separating the pumping section and the driving section



and being constructed for pumping the entire volume of the pumping section into the balloon during the phase when the source of high pressure is connected and for driving the entire volume of the driving section into the low pressure source when the low pressure source is connected to the driving section.

3,712,291

METHOD FOR ADMINISTERING IRON AND OTHER METALS

Michael W. Freeman, 401 David Whitney Building, Detroit, Mich.

Filed Oct. 2, 1968, Ser. No. 765,273
Int. Cl. A61k 27/00; A61b 17/52
U.S. Cl. 128—1.3 10 Claims

Exemplary Claim

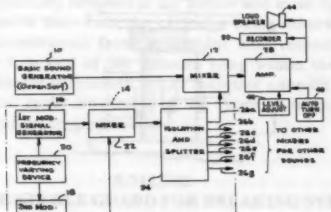
A method of treating a human iron deficiency comprising administering rectally or sublingually an effective amount of alpha-iron particles of from about 0.01 to about 1 micron so that the alpha-iron particles are rapidly adsorbed and transported via the blood stream to the iron deficient blood-forming system of the human body.

3,712,292

METHOD AND APPARATUS FOR PRODUCING SWEPT FREQUENCY-MODULATED AUDIO SIGNAL PATTERNS FOR INDUCING SLEEP

John E. Zentmeyer, Jr., Charlottesville, Va., assignor to Karen V. Lafley, Charlottesville, Va.

Filed July 20, 1971, Ser. No. 164,389
Int. Cl. A61n 1/34
U.S. Cl. 128—1 C 13 Claims



A method of producing sound signals for inducing sleep in a human being, and apparatus therefor together with REPRESENTATIONS thereof in recorded form, wherein an

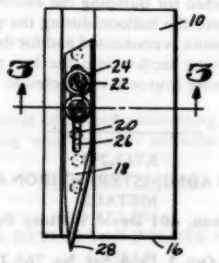
audio signal is generated representing a familiar, pleasing, repetitive sound, modulated by continuously sweeping frequencies in two selected frequency ranges having the dominant frequencies which occur in electrical wave patterns of the human brain during certain states of sleep. The volume of the audio signal is adjusted to mask the ambient noise and the subject can select any of several familiar, repetitive sounds most pleasing to him.

3,712,293

APPARATUS AND METHOD FOR MEASURING HEMOSTATIC PROPERTIES OF PLATELETS

Clarence Harold Mielke, Jr., 10 Ludwig Road, Needham Heights, Mass.

Filed July 27, 1970, Ser. No. 58,252
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 G **4 Claims**



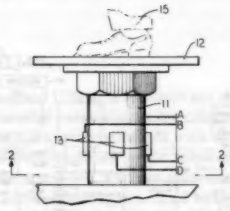
An apparatus and method for making a standardized reproducible blade incision in the subject's forearm for the purpose of measuring his bleeding time. A blade is precisely mounted on the blade holder by use of a gauge block, and a flat template with standard thickness and standard length of slot is used to guide the blade and limit the depth and length of incision.

3,712,294

METHOD AND APPARATUS FOR MEASURING HUMAN REACTION

John T. Muller, 50 West Lawn Road, Livingston Township, Essex County, N.J.

Filed July 24, 1970, Ser. No. 58,078
Int. Cl. A61b *5/10*
U.S. Cl. 128—2 N **10 Claims**



Method and Apparatus for measuring human reaction wherein the test apparatus comprises a platform for supporting a person being tested, a support, a rod mounted vertically between the platform and the support, sensors for detecting deflections of the rod and a display device for recording the output of the sensors.

3,712,295

CENTRIFUGE TUBE

William M. Kline, 55 Forest Street, Gloversville, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,354
Int. Cl. A61b *10/00*; **A61m** *1/00*
U.S. Cl. 128—2 F **3 Claims**

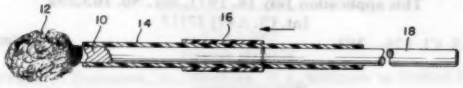
This invention is directed to a centrifuge tube formed from molded plastic and includes a body shaped as a bellows-folded helix having a closed bottom and a syringe tip at its top. The bottom may be pierced following centrifuging of the contents by a double tipped needle so that the tube may also serve as a positive syringe to expel any desired portion of the collected solids for subsequent examination.

3,712,296

SWAB DEVICE FOR MEDICAL SPECIMENS

Frank P. Gradone, 49 Midland Place, Newark, N.J.

Filed Dec. 8, 1970, Ser. No. 96,094
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 W **1 Claim**



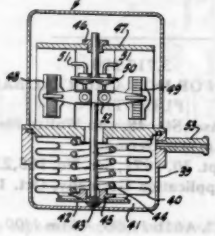
A swab device wherein a rod having a specimen receiving material attached thereto is carried by a sleeve during receipt of the specimen, and is adapted to be pushed out of the sleeve for testing purposes without being contacted by human hands.

3,712,297

BLOOD PRESSURE MEASURING DEVICES WITH VARIABLE FREQUENCY RECORDER AND LINEARIZED LEAK MEANS

Harry A. Greene, Jr., Sausalito, Calif., and Charles Wing, El Cerrito, Calif., assignors to Rembler Company, San Francisco, Calif

Filed May 15, 1970, Ser. No. 37,625
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 Q **3 Claims**



A blood pressure measuring device is disclosed in which variations in pressure are translated into variations in frequen-

cy which are then magnetically recorded. A pressure controlled switch superimposes pressure reference pulses on the variations in frequency and audible brachial pulses are simultaneously recorded. An approximately linear looking pressure variation characteristic is obtained by varying the area of a leak off opening over the pressure range.

3,712,298

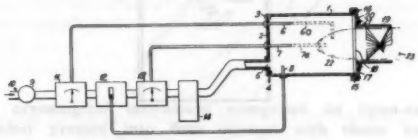
MEDICAL TREATMENT APPARATUS

Charles Snowdon, Esher, and Robert Gonne Redhead, Richmond, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 25, 1970, Ser. No. 66,767

Int. Cl. A61h *1/00*

U.S. Cl. 128—40 **6 Claims**



Apparatus and method for treating a human limb. The apparatus comprises a container connected to a source of gas under pressure. The limb intrudes into the container through a seal which allows gas to leak out over the surface of the limb at a controlled rate, so ventilating the limb. The leaking seal is so constructed that it applies no tourniquet effect to the distal end of the limb within the container. The seal may register with a substantial length of the limb, which may thus be subjected to a beneficial pressure gradient.

3,712,299

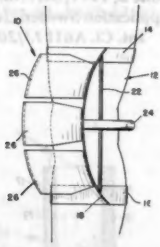
KNEE GUARD

Richard K. Voehl, Apartment 434, 10875 North Kendall Drive, Miami, Fla.

Filed March 24, 1971, Ser. No. 127,706

Int. Cl. A61f *3/00*

U.S. Cl. 128—80 C **10 Claims**



A protective knee guard includes first and second spaced members adapted to be secured to the tibial and femur portions of a knee joint. The members are interconnected by elongated relatively rigid members maintained in an arched condition by safety chains. A plurality of guard members extend forwardly of and interconnect the elongated members.

3,712,300

HEMORRHOIDAL SUPPORT

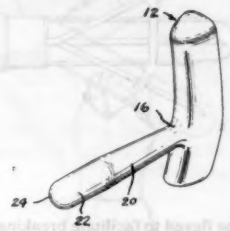
Solomon Davidowitz, 153-38 58th Avenue, Flushing, N.Y.

Filed Sept. 20, 1971, Ser. No. 181,876

Int. Cl. A61f *5/24*

U.S. Cl. 128—98 **10 Claims**

A hemorrhoid support shaped to utilize the sphincter rectal muscle for retaining the rectal insert portion thereof in an inserted position with an enlarged cylindrical head portion of the insert's oblong length exerting a mild pressure against distended vascular structure of the wearer, the hemorrhoid support having intimate with a narrowed base of the conical portion of the insert a crotch-bar extending substantially linearlly at about a right angle to the rectal insert in a rearward



direction and extending in a slight arc a lesser distance forwardly at a slightly acute angle relative to the rectal insert, there being utilizable with the hemorrhoid support as a part thereof a support strap attached at least to the forward arc portion of the crotch-bar and extending rearwardly to an aft attachment to a waist belt.

3,712,301

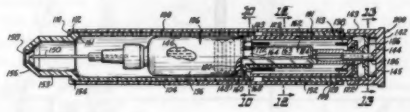
GUN TYPE HYPODERMIC INJECTOR WITH RAPID CARTRIDGE DISPLACEMENT WITHIN HOLDER

Stanley Sarnoff, Bethesda, Md., assignor to Survival Technology Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 751,395, Aug. 9, 1968, abandoned, and a continuation of Ser. No. 839,794, June 26, 1969, abandoned. This application Jan. 11, 1971, Ser. No. 105,728

Int. Cl. A61m *5/20*

U.S. Cl. 128—218 A **13 Claims**



A hypodermic injector is provided comprising a sleeve housing a cocked spring impelled plunger, a cartridge holder with a cannula pierceable stopper at the front end thereof attached to the sleeve and a cartridge with front end attached cannula in the holder wherein the rear end only of the cartridge is frictionally retained in the holder and in air tight sealing engagement therewith, the cartridge being otherwise substantially unrestrained from movement with respect to the holder, the free end of the cannula lying within the holder until the plunger is released, all to maintain cannula sterility and yet allow rapid movement of the cartridge in the holder when the plunger is operative.

3,712,302

FLEXIBLE NEEDLE GUARD FOR BREAKING SYRINGE NEEDLES

George K. Burke, and Kenneth Raines, both of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

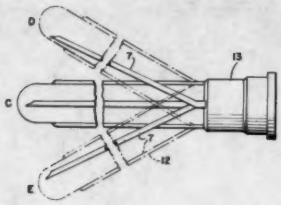
Filed Sept. 2, 1970, Ser. No. 68,937

Int. Cl. A61m *5/00, 5/04*

U.S. Cl. 128—221 **13 Claims**

A needle guard for disposable syringes, the needle guard

provided with a portion of reduced thickness so that the needle guard may be flexed to facilitate breaking of the needle encased in the needle guard.



3,712,303

SPERM TRANSFER METHOD

Hans Merkt, Im Gehage 2, Isernhagen, Germany, and Joachim Hannig, Universidad de Chile, Santiago, Chile

Filed July 1, 1970, Ser. No. 51,484
Int. Cl. A61d *07/02*
U.S. Cl. 128—264 **6 Claims**

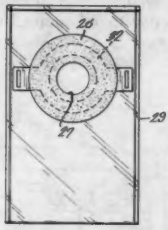
Animal sperm is inserted into geletin capules and freeze-sealed with a plug of felt-like material extending across the open end portion of each capsule, the peripheral portion of each plug extending slightly beyond the external wall of the capsule. Prior to sealing, each plug is wetted at its under surface with a sterile liquid and the seal is obtained by freezing. Each plug has a ferromagnetic coat on its upper surface. The capsules are placed in serial array, in a storage tube having a closed end. A ferromagnetic cap having a clip extending therefrom is placed on and into the open end of the tube with the clip extending thereinto and bearing against the internal wall thereof, in which condition the capsules are placed in a freezer-container. In use, a tube is removed from the container and a rod having a permanent magnet at one end is used to remove the cap and also to remove a capsule therefrom. The rod and capsule are then placed in a pipette having an open end and a radially inwardly extending flange providing a smaller opening at the other end thereof. The pipette is inserted into a female animal and the capsule is moved by, said flange. When body heat melts the liquid, the pipette, rod and closure are withdrawn from the animal. The free surface of the coat may be labeled with significant indicia.

3,712,304

STARCH SEAL AND APPLIANCE FOR OSTOMY

Arthur E. Marsan, 640 Washington Boulevard, Oak Park, Ill.

Continuation-in-part of Ser. No. 795,138, Jan. 24, 1969, abandoned, and a continuation-in-part of Ser. No. 110,234, Jan. 27, 1971. This application Nov. 17, 1970, Ser. No. 90,368
Int. Cl. A61f *5/44*
U.S. Cl. 128—283 **3 Claims**



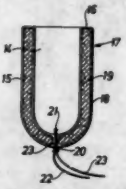
This invention provides an improved sealing means for application to patients who have had surgery for colostomy or ileostomy, and the like, for effecting a seal between the patient's skin around the stoma and a pouch or container which receives the fecal discharge from the stoma. The sealing means is characterized by its starch content, which has qualities providing new and beneficial functions and advantages distinguishing from the prior art. The sealing means is made by methods which I have termed the liquid pouring type and the dough type.

3,712,305

TAMPON FOR TAKING UP MENSTRUAL LIQUIDS

Bengt Axel Wennerblom, Sundsvall; Per Edward Carl Udden; Anna Britt Udden, both of Timra, and Ivar Lindgren, Sorberge, all of Sweden, assignors to Svenska Cellulosa Aktiebolaget, Sundsvall, Sweden

Filed June 2, 1971, Ser. No. 149,155
Claims priority, application Sweden, June 3, 1970, 7721/70
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 **13 Claims**



A tampon is disclosed for taking up menstrual fluids having as the main portion thereof a dry folded sheet material which is muff- or hose-shaped. The tampon is constricted and pulling means are attached at the point of constriction. The sheet material has an inner layer of absorbent fibrous material with relatively weak internal cohesion. A thin cover layer with relatively strong internal cohesion is used to prevent release of inner layer fibers. The configuration aids in insertion and the materials give good characteristics during use.

3,712,306

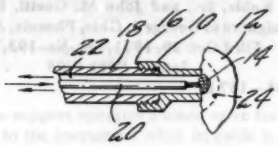
CRYOGENIC APPLICATION CHAMBER AND METHOD

Michael D. Bryne, Vernon, Conn., assignor to Brymill Corporation, Vernon, Conn.

Continuation of Ser. No. 886,260, Dec. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 728,536, May 13, 1968. This application Nov. 9, 1971, Ser. No. 197,182

Int. Cl. A61b *17/36*

U.S. Cl. 128—303.1 8 Claims



A cryosurgical instrument comprises an open-ended chamber pressed into firm contact with tissue to be necrotized. A stream of liquified gas coolant (such as nitrogen), in substantially the liquid phase, impinges directly on the tissue. In one embodiment, the coolant-delivery instrument provides venting of vapors from the chambers through an applicator vent tube. In another embodiment, the cryogenic application chamber comprises a cylindrical tube connected to a source of pressurized coolant, the distal end of the tube being open and adapted for application to a subject, the proximal end adapted for connection with the source, there being a vent hole through the wall of the tube near the proximal end. The chambers may assume a variety of configurations in order to gain easy access to lesions which are to be necrotized. The chambers may be used to apply a bulk of liquid or to confine a controlled, substantially liquid spray, in accordance with methods disclosed herein.

3,712,307

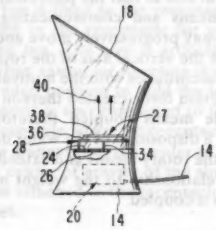
SKIN CONDITIONING APPARATUS

Veronica H. McLaughlin, 5521 El Sereno, Los Altos, Calif.

Filed Aug. 25, 1971, Ser. No. 174,832

Int. Cl. A61h *33/00*

U.S. Cl. 128—368 7 Claims



Apparatus for conditioning the skin with the use of a facial sauna unit having an open top for receiving the face, neck or other body part to be conditioned wherein the apparatus utilizes a pad saturated or soaked with a material containing oils, proteins and an emulsifying agent. The pad is supported in the sauna unit across the path of the rising steam or water vapor therein. As the water vapor passes through the pad and exits therefrom, particles of the material are carried therewith for contact with the skin of the face, neck or other body part which extends across the open top of the unit.

3,712,308

GARMENTS FOR WOMEN

Henry M. Herbener, 803 N. Dawson St., P. O. Box 977, Thomasville, Ga.

Filed March 13, 1970, Ser. No. 19,204

Int. Cl. A41c *1/00*

U.S. Cl. 128—519 1 Claim

A garment formed at least in part of elastic material has an opening provided in the crotch thereof. A cover element in the form of a panty also formed at least in part of elastic material is worm over the main garment to cover the crotch opening and to restore body controlling compression lost in the main garment due to the provision of the crotch opening. The cover element may be attached to the main garment. The invention is applicable to a wide variety of body garments.

3,712,309

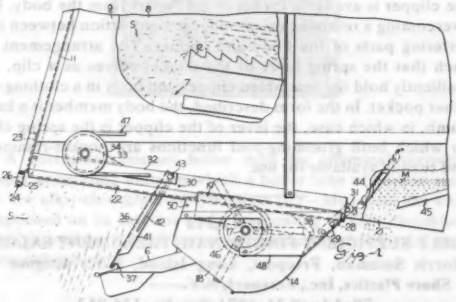
STRAW CHOPPER MOUNTING FOR COMBINE

Raymond B. Schmitz, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed March 29, 1972, Ser. No. 239,244

Int. Cl. A01f *12/40*

U.S. Cl. 130—27 R 5 Claims



An improved mounting for a straw chopper on a combine, wherein the straw chopper can be readily moved from an operative position mounted on the rear end of the combine in underlying material receiving relation to the discharge end of the combine straw rack to an inoperative position forward from such operative position but still carried by the combine.

3,712,310

HAIR WAVE AND CURLING DEVICE

Peter Parlagreco, 8013-13th Avenue, Brooklyn, N.Y.

Filed July 8, 1971, Ser. No. 160,627

Int. Cl. A45d *2/00*

U.S. Cl. 132—40 2 Claims

The device is a hair waving and curling roller with a concentric, movable, inner rod. This flexible rod has a fin projectible

through an opening in the roller. In one position, the fin maintains full roller diameter. In another, it reduces the roller size

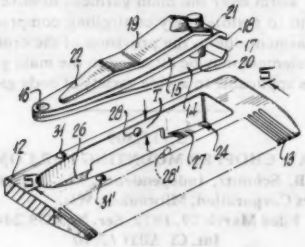
after hair rolled on it has become saturated and softened. This causes the hair ends to curl tighter and creates a well shaped curl at the ends of the strands.

3,712,311

CLIPPER-COMBINED DEVICE

Jon Hedu, Watertown, Conn., assignor to The W. E. Bassett Company, Derby, Conn.

Filed Dec. 15, 1971, Ser. No. 208,107
Int. Cl. A45d *29/00*
U.S. Cl. 132—73 **12 Claims**



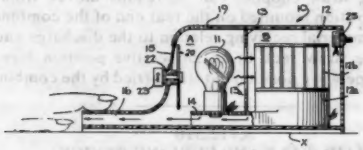
The invention provides a novel combination of a nail clipper and molded plastic case or retaining body therefor, such that the clipper is available for ready use, apart from the body, by overcoming a retaining detent-engagement action between interfering parts of the body and clipper. The arrangement is such that the spring lever of the clipper serves as a clip, to resiliently hold the assembled clipper and body in a clothing or other pocket. In the form described, the body member is a hair comb, in which case, the lever of the clipper is the spring clip by which both grooming-tool functions are pocket-retained and readily available for use.

3,712,312

SELF-SUFFICIENT FINGER-NAIL TREATMENT SALON

Morris Sussman, Freeport, Long Island, N.Y., assignor to Shore Plastics, Inc., Freeport, N.Y.

Filed April 21, 1971, Ser. No. 136,053
Int. Cl. A45h *29/05*
U.S. Cl. 132—73.6 **6 Claims**



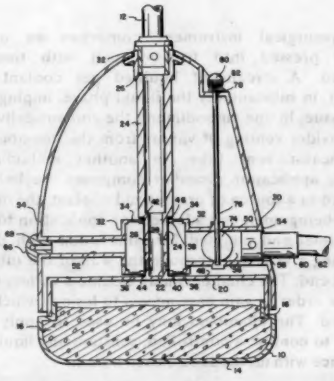
A self-sufficient finger-nail treatment salon in which the user is supplied with bottles of nail polish, nail-working tools, and means to illuminate the nails with light rays simulating the environmental conditions under which the nails will be exposed. The salon includes a console housing a bulb whose rays are selectively filtered to provide the desired illumination, and a blower drawing air heated by the bulb and directing it through an open-ended duct whose upper wall serves as a work counter for applying polish to the nails, the heated air discharged from the duct being used to dry the applied nail polish.

3,712,313

POOL CLEANING APPARATUS

Robert L. Koble, Jr., and John M. Goettl, both of Phoenix, Ariz., assignors to George J. Ghiz, Phoenix, Ariz.

Filed Oct. 29, 1971, Ser. No. 193,713
Int. Cl. B08b *9/08*
U.S. Cl. 134—167 R **8 Claims**



A pool cleaning apparatus wherein a manually movable weight means is disposable in various positions on the bottom of a swimming pool and a flexible water delivery conduit is coupled to the weight means and communicates with a rotary means having a passage therein which delivers water to a flexible sinuously movable pool cleaning tube; communicating with said passage means and coupled to said rotary means is a jet nozzle adapted to cause rotation of said rotary means about a generally vertical axis so that the pool cleaning tube coupled to said rotary means and communicating with the water delivery conduit may progressively move and be directed outwardly away from the vertical axis of the rotary means in various directions in accordance with the motivation of said rotary means by jet reaction force created thereon due to operation of the jet nozzle means coupled thereto. The disclosure further sets forth a disposition of the water delivery tube communicating with the rotary means and extending in a generally upward central relationship to the weight means with which said rotary means is coupled.

3,712,314

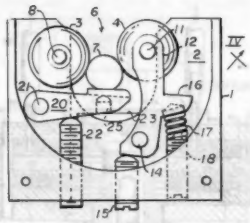
DENTAL INSTRUMENT HOSE CLIP WITH SELECTOR VALVE

Richard W. Page, P. O. Box 258B, Chatham, Mass.

Filed May 4, 1970, Ser. No. 34,124
Int. Cl. A61c *19/00*
U.S. Cl. 137—560 **9 Claims**

A clip for releasably holding the cable of a drill or other dental instrument has adjustable and spring-pressed rollers or wheels cooperating with a subjacent adjustable support for gripping the cable. The adjustments permit ready insertion

and removal by moving the cable transversely to its axis, while holding against movement parallel to the cable axis. The



movement of the support operates a bleed valve for activating the fluid supply to the instrument when its cable is gripped in the clip.

3,712,315

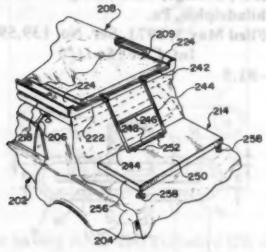
COLLAPSIBLE SHELTER FOR MOUNTING ON A TRANSPORTATION VEHICLE

Erwin F. Franzen, 3673 Randolph Street, Lansing, Ill.

Continuation-in-part of Ser. No. 36,709, May 13, 1970, abandoned. This application March 31, 1971, Ser. No. 129,924

Int. Cl. B60p *3/34*

U.S. Cl. 135—1 A **2 Claims**



A collapsible shelter is mountable on a transportation vehicle and is carried by the vehicle. The shelter includes a rigid receptacle for holding equipment, including a mattress or sleeping bags. A top is fixed to the receptacle, and a bow is hingedly connected to the receptacle for selectively raising and supporting the top. The bow is articulated to allow the bow to be bent when raising or lowering the top, but is then locked in an extended position to hold the top in a raised attitude. A pair of posts is also connected to the receptacle for supporting the receptacle when the receptacle is mounted on a vehicle in such a manner that the center of support does not coincide with the center of gravity of the shelter. The shelter also has a platform attached to the receptacle, which platform has self-storing feet.

3,712,316

COLLAPSIBLE TENT DEVICE

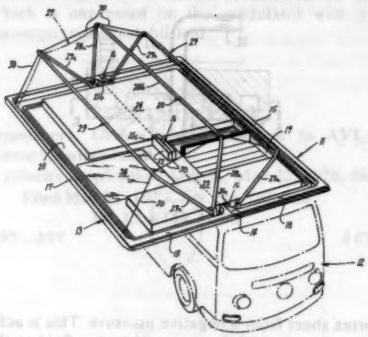
David L. Leonard, 4 Charlton Court, San Francisco, Calif.

Filed July 13, 1970, Ser. No. 54,415

Int. Cl. A45f *1/00*; B60p *3/32*

U.S. Cl. 135—1 A **7 Claims**

A collapsible tent device for mounting onto a vehicle top including a base frame member mounted to the vehicle and a side frame mounted to pivot to the side of the vehicle and to a closed box-like carrier position over the vehicle. Foldable mattresses may extend across the vehicle. The side frame and a cover for the tent are supported in an open position by cables which rotate support elements into spaced apart relation-



ship. Access is provided from within the vehicle by means of an opening in the base frame member.

3,712,317

CORROSION RESISTANT BOILER TUBE FOR CHEMICAL RECOVERY VAPOR GENERATING UNIT

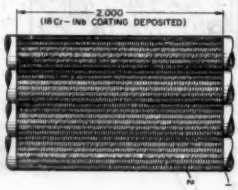
Tsuneto Hayashi; Hidejiro Kinoshita, and Koji Iwahashi, all of Nagasaki, Japan, assignors to Messrs. Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 671,075, Sept. 27, 1967, abandoned. This application Jan. 8, 1970, Ser. No. 3,573

Claims priority, application Japan, Sept. 29, 1966, 41/91214

Int. Cl. F16l *9/14, 9/02*

U.S. Cl. 138—145 **6 Claims**



A corrosion resistant boiler tube for chemical recovery vapor generating units, in which a boiler tube of carbon steel or low alloy chromium-molybdenum [Cr—Mo] steel has weld deposited on its exterior surface a coating of high chromium steel containing 13–26 percent chromium and 0.5 – 1.5 percent columbium.

ERRATUM

For Class 137—560 see:
Patent No. 3,712,314

3,712,318

VORTEX PROXIMITY SENSOR WITH INCREASED SENSING RANGE

Anthony Kopera, Beltsville, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.

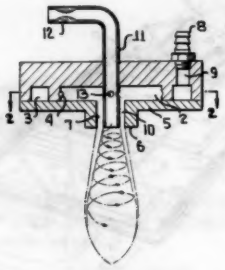
Continuation-in-part of Ser. No. 835,643, June 23, 1969, abandoned. This application Oct. 21, 1970, Ser. No. 82,640

Int. Cl. F15c *1/16*

U.S. Cl. 137—13 **20 Claims**

Proximity sensing is achieved by issuing a vortical sheet of fluid from an axial outlet passage of a vortex chamber and sensing the static pressure in a sensor tube disposed along the chamber axis. Pressure in the sensor tube is a function of ob-

ject proximity to the outlet passage. Premature collapse of the vortical sheet is prevented by raising the pressure interiorly of



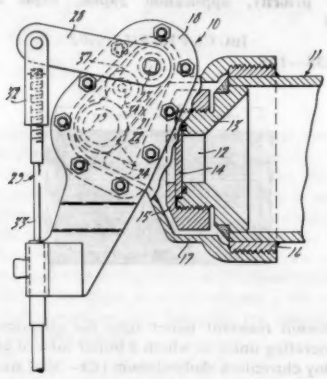
the vortex sheet from a negative pressure. This is achieved by supplying a portion of the vortex chamber fluid to the sensor tube and hence to the interior of the vortex sheet.

3,712,319

RELEASE VALVE FOR A COMPRESSED GAS CONTAINER

Alex Rhodes, Detroit, and Allen C. Wright, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 20, 1971, Ser. No. 190,851
Int. Cl. B67b 7/24; F16k 13/04
U.S. Cl. 137—68 **7 Claims**



A release valve for a compressed gas container in which the gas is sealed in the container by a frangible closure. The release valve houses a lever adapted to impact and perforate the frangible closure to release the compressed gas. The perforating lever is coupled to an actuating lever which in turn is coupled, for example, to a structural member of a vehicle. Upon deformation of the structural member, as upon a collision impact, the force is transmitted to the perforating lever to cause the latter to puncture the frangible closure. The released gas may be used to inflate the passenger restraint device, such as an air bag.

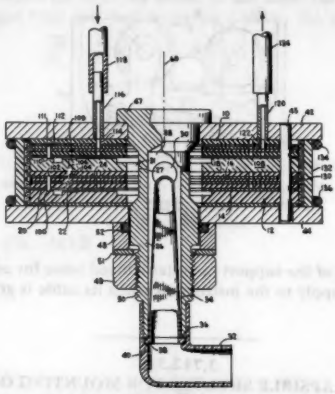
3,712,320

AN ANNULAR FLUIDIC CONTROL DEVICE

Theodore J. Jansen, Stratford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed April 30, 1971, Ser. No. 138,908
Int. Cl. F15c 1/18
U.S. Cl. 137—81.5 **9 Claims**

A fluidic apparatus comprises an annular shaped body which includes a centrally located aperture extending through a thickness of the body. The body includes a plurality of fluidic devices formed therein and which are positioned about the aperture. A flow channel means for each of the devices communicates between the aperture and an associated device



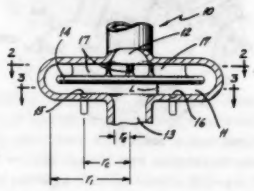
while a gas flow manifold extends into the aperture and conveys a gas from a source to the flow channel means. Through this arrangement, the operating characteristics of the apparatus are enhanced.

3,712,321

LOW LOSS VORTEX FLUID AMPLIFIER VALVE

Andrew B. Bauer, Orange, Calif., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed May 3, 1971, Ser. No. 139,599
Int. Cl. F15c 1/16
U.S. Cl. 137—81.5 **11 Claims**



A low loss fluid amplifier valve comprising a vortex chamber having axially aligned inlet and outlet ports, and a disk axially aligned therewith in the chamber. The disk is interposed between the ports, and includes radially extending vanes on surface portions thereof facing the inlet port. A pair of tangentially-directed control fluid injection ports are located to the side of the disk facing the outlet port, and are spaced radially of the chamber intermediate its axis and its peripheral curved wall. Introduction of tangential control flow into the vortex chamber effectively shuts off flow through the valve, with control fluid leaking from the valve's outlet port in only minimal amount, and flowing radially inwardly, in a reverse direction, from the vortex chamber to pass back through the inlet port.

3,712,322

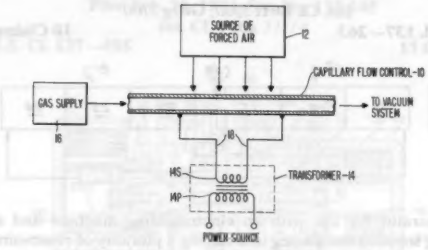
APPARATUS FOR VARYING THE FLOW RATE OF GAS INTO A VACUUM SYSTEM

Thomas R. Cleary, Drexel Hill, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 6, 1970, Ser. No. 52,263
Int. Cl. F15c 1/04
U.S. Cl. 137—81.5 **9 Claims**

A capillary leak for supplying controlled amounts of gases to a vacuum system. The rate of flow of gas into the system is

controlled by controlling the temperature of the capillary tube. The tube is heated by passing an electrical current through a portion of it and is colled either by forced air or by a

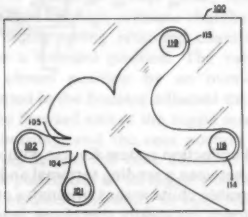


water jacket. The use of a water jacket enables use of the apparatus within the vacuum chamber thereby decreasing system response time.

3,712,323
FLUIDIC HALF-ADDER

Anthony John Healey, State College, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 8, 1970, Ser. No. 70,131
Int. Cl. F15c *1/10*
U.S. Cl. 137—81.5 **7 Claims**

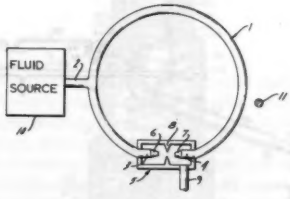


A fluidic gate having AND and exclusive OR outputs is disclosed in which control of the outputs is dependent upon the geometry of the interaction chamber and not upon the Coanda wall attachment phenomenon.

3,712,324
FLUIDIC ACCELEROMETER

Otto R. Munch, West Allis, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Jan. 26, 1970, Ser. No. 5,650
Int. Cl. F15c *1/00*
U.S. Cl. 137—81.5 **5 Claims**

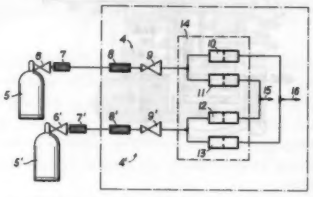


This disclosure includes a fluidic accelerometer in the form of a split looped planar conduit terminating in a pair of opposed nozzles and having a center supply connection to establish flow in opposite directions. A summing impact modulator or other fluidic amplifier is connected to the conduit nozzles to provide an amplified fluidic output signal. Angular acceleration of the conduit about an axis perpendicular to the plane of the conduit results in a pressure gradient along the conduit resulting in a differential pressure at the ends or nozzles which is impressed on the modulator with a corresponding output signal established.

3,712,325
GAS MIXER

Karl Harnoncourt, Graz, Austria, assignor to AVL AG, Schaffhausen, Switzerland

Claims priority, application Austria, May 22, 1970, 4647/70
Filed May 21, 1971, Ser. No. 145,765
Int. Cl. F16k *11/00*
U.S. Cl. 137—597 **4 Claims**

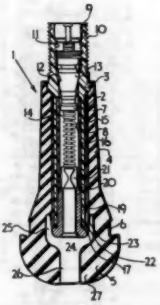


A gas mixer useful for production of test gases for blood gas analyzers. The mixer comprises a pair of high-precision pressure regulators, each adapted for receiving a different gas from a supply source. A separate pair of orifice plates are provided downstream from each regulator. The plates of each pair are arranged in parallel. The outlets of one orifice plate of each pair are connected into a pipe to provide a source of mixed gas. The outlets of the other plate of each pair are connected into another pipe to provide a separate source of mixed gas.

3,712,326
INFLATION VALVES

Stephen E. W. Thacker, Birmingham 24, England, assignor to Dunlop Holdings, Limited, Birminham, England

Filed Sept. 11, 1970, Ser. No. 71,593
Claims priority, application Great Britain, Sept. 23, 1969, 46,760/69
Int. Cl. F16k *15/20*
U.S. Cl. 137—223 **10 Claims**

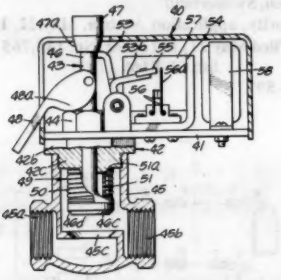


An inflation valve for a tubeless tire comprising a valve stem formed with interior projections for location of a valve core, the stem being embedded within a mushroom-shaped rubber body and the whole assembly being capable of being inserted into a valve aperture by hand without the aid of an insertion tool. The stem is preferably moulded from reinforced plastics material, e.g., glass-fiber reinforced nylon.

3,712,327
AUTOMATIC LEAK DETECTION AND SHUTOFF SYSTEM

Stanley W. Pagenkopf, 2309 East Avalon Street, Santa Ana, Calif.

Filed March 23, 1971, Ser. No. 127,185
Int. Cl. F16k *17/36*
U.S. Cl. 137—78 10 Claims

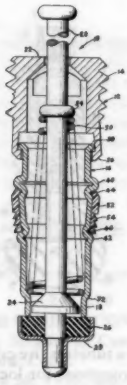


An automatic leak detection and shutoff system wherein a sensor comprised of a pair of electrical grids separated by a moisture sensitive substance is electrically connected to an electrical power source which in turn is electrically connected to a solenoid engaged with a spring activated valve positioned in the line of a system so that when the moisture sensitive substance is sufficiently moist, the moisture causes a short circuit between the electrical grids whereby a continuous electrical circuit is created resulting in an electrical flow from the power source thereby activating the solenoid which mechanically releases the spring actuated valve allowing said valve to close so as to prohibit further passage of fluid in the system.

3,712,328
TIRE VALVE CORE

Milton Beasley McAnally, Nashville, Tenn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 5, 1971, Ser. No. 169,235
Int. Cl. F16k *15/20*
U.S. Cl. 137—234.5 6 Claims

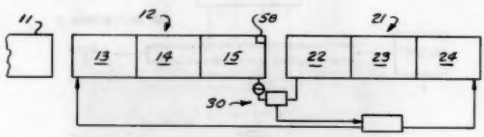


Tire valve core has drawn metal shell with ridges on either side of plastic shell gasket and grooves aligned with edges of gasket to receive plastic flow and anchor gasket securely.

3,712,329
PLATING SOLUTION PICKUP UNIT

Bert Streeter, Indianapolis, Ind., assignor to Dean Brothers Pumps, Inc., Indianapolis, Ind.

Filed Oct. 8, 1968, Ser. No. 765,919
Int. Cl. B01f *5/00*; G01g *5/00*
U.S. Cl. 137—263 10 Claims

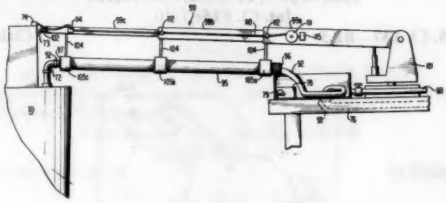


Apparatus for use with an electroplating machine and a plating solution reclaiming unit having a plurality of reservoirs for receiving rinse system effluent and plating solution from the plating machine and controlling their flow to the reclaiming unit.

3,712,330
LIQUID SPILL COLLECTION SYSTEM

Murray A. Davis, Ridge, Md.

Filed Oct. 16, 1970, Ser. No. 81,283
Int. Cl. B67d *5/00*
U.S. Cl. 137—312 22 Claims

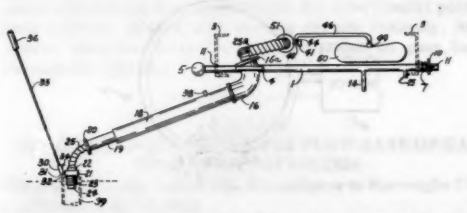


A liquid spill collection system for use with a liquid transfer line connected between a sending terminal and a receiving terminal. An extensible chute means originates at one of the terminals and extends outwardly therefrom beneath the liquid transfer line to the other terminal. At one end the extensible chute terminates in a drain trough so that any liquid spilling or leaking from the hose is collected by the chute and delivered by the drain trough. In another embodiment a collector hose of diameter greater than the diameter of the transfer line is installed about the transfer line coextensively therewith and is connected to the drain trough.

3,712,331
HOLDING TANK EVACUATING APPARATUS FOR A RECREATIONAL VEHICLE

Carlos F. Otto, P.O. Box 283, Lander, Wyo.

Filed March 3, 1971, Ser. No. 120,626
Int. Cl. B65h *75/36*
U.S. Cl. 137—355.16 12 Claims



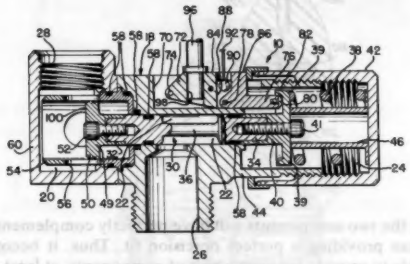
Apparatus for evacuating the holding tank of a recreational vehicle including a flexible hose and a carrier rotatably attached to the vehicle and a rigid sleeve for supporting the hose at all times.

3,712,332

PRESSURE REGULATING VALVE

Lyle D. Galbraith, Redmond, and Alan R. Harvey, Bellevue, both of Wash., assignors to Rocket Research Corporation, Redmond, Wash.

Filed Feb. 26, 1971, Ser. No. 119,145
Int. Cl. F16k *31/14*
U.S. Cl. 137—495 11 Claims



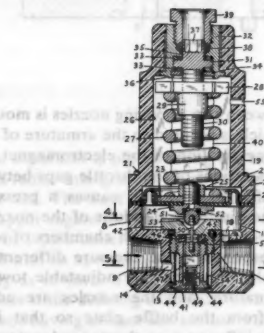
A pressure regulating valve adapted to receive high pressure fluid from, for example, a bottle of compressed gas and to direct this gas at a substantially constant pressure to accomplish, for example, a function such as pressurizing or inflating a life raft, bag or other device. The valve comprises a housing defining a front regulating chamber, a middle high pressure chamber and a rear spring retaining chamber. Within the housing is a valve element comprising front and rear piston members joined by a rod. In the closed position of the valve the front and rear piston members close, respectively, the front and rear ends of the high pressure chamber, with a compression spring in the spring retaining chamber urging the valve element to a forward position. The valve element is retained in its closed position by an over-center toggle mechanism mounted in the housing adjacent the high pressure chamber, with the forward end of the toggle mechanism bearing against the housing, and the rear portion of the toggle mechanism bearing against the valve element. When the toggle mechanism is pulled out of its toggle position, the spring moves the valve element forwardly to open the front end of the pressure chamber to the regulating chamber. The pressure in the regulating chamber acts on the forward end of the valve element to balance the force of the compression spring and thus control the pressure in the regulating chamber. A high pressure inlet opening communicates laterally into the high pressure chamber, and a regulated pressure outlet opening extends laterally from the regulating chamber.

3,712,333

FLUID PRESSURE COMPENSATING REGULATOR

Albert L. Semon, 11 Eliot Place, Short Hills, N.J.

Filed Sept. 23, 1970, Ser. No. 74,616
Int. Cl. F16k *17/22*
U.S. Cl. 137—498 3 Claims



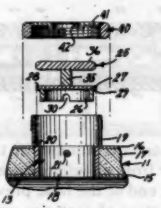
This invention relates to a pressure regulator utilizing a compensating valve seat to maintain the outlet pressure substantially constant even though the inlet pressure is decreased.

3,712,334

VACUUM BREAKER VALVE FOR SHELL-LIKE TANKS

Arthur L. Rolfzen, St. Cloud, Minn., assignor to Polar Manufacturing Company, Holdingford, Minn.

Filed March 24, 1971, Ser. No. 127,716
Int. Cl. F16k *31/44*; F16k *45/00*
U.S. Cl. 137—587 6 Claims



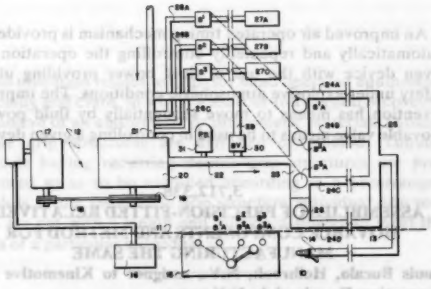
A tank having an air inlet opening adjacent the upper portion thereof and an outlet and outlet valve adjacent the lower portion thereof for draining the tank. An actuator associated with the valve and recessed within an opening so that standard tools, such as wrenches and the like, cannot be utilized to open the valve. An adapter tool, constructed to mate with the actuator and adapted for use with standard tools, forming a portion of a seal and fitting within the air inlet so that the air inlet must be opened to gain access to the adapter tool before the outlet valve can be operated.

3,712,335

CAR WASH SYSTEM

Jacob R. Wiebe, 1133 Henderson Highway, Winnip, 33 Manitoba, Canada

Filed Jan. 18, 1971, Ser. No. 107,094
Int. Cl. F16k *19/00*
U.S. Cl. 137—599 1 Claim

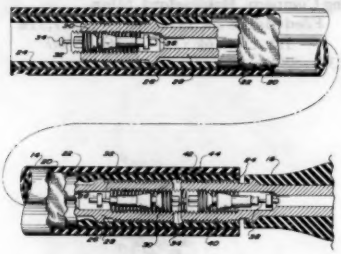


A separate pump is used for each car wash bay and a plurality of conduits extend from adjacent the pump to the nozzle boom in the bay. Each conduit carries a different solution such as wash water, rinse water and the like. Valves permit the operator to switch from one conduit to the other thus eliminating the necessity of emptying the conduits completely of one solution before the next solution is available.

3,712,336
AIR TRANSFER LINE

William Roland Bell, Jr., 800 25th Street, Snyder, Tex.

Filed Feb. 18, 1971, Ser. No. 116,424
Int. Cl. F16k 15/20
U.S. Cl. 137—613 1 Claim

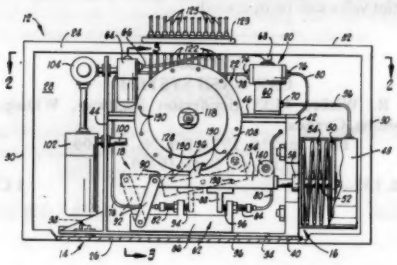


A hose with a standard automobile tire valve in each end is used to transfer air from an inflated tire to a flat tire. The standard valve in each end of the hose prevents loss of the air and also depresses the stem of each tire valve. The rubber tube is soft at each end to flow under air pressure, but is confined by a layer of fabric.

3,712,337
AIR OPERATED TIMING MECHANISM

Jack W. Kice, and Herbert D. Vanderlip, both of Wichita, Kans., assignors to K-B Engineering Company

Filed Feb. 22, 1971, Ser. No. 117,369
Int. Cl. F15b 11/08, 13/04; F16h 53/00
U.S. Cl. 137—624.14 4 Claims



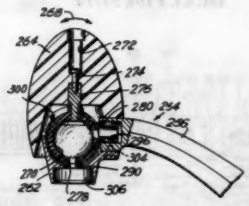
An improved air operated timing mechanism is provided for automatically and repeatedly controlling the operation of a given device with the use of fluid power providing utmost safety under explosive atmospheric conditions. The improved invention has means to move sequentially by fluid power a movable valve means to be used in controlling a given device.

3,712,338
ASSEMBLIES OF PRECISION-FITTED RELATIVELY MOVABLE COMPONENTS AND METHOD FOR MANUFACTURING THE SAME

Louis Bucalo, Holbrook, N.Y., assignor to Kinemotive Corporation, Farmingdale, N.Y.

Division of Ser. No. 826,992, May 22, 1969, Pat. No. 3,616,520. This application Nov. 20, 1970, Ser. No. 91,497
Int. Cl. F16k 11/00, 5/06
U.S. Cl. 137—625.41 12 Claims

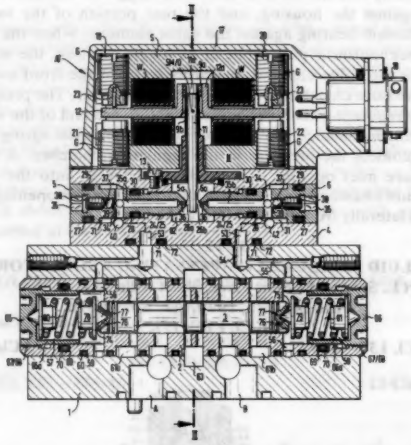
An assembly of at least two precision-fitted components, wherein at least one of the components is movable relative to the other, and a method of manufacturing the assembly. One of the components is formed directly on the other by techniques already known in connection with deposition of molecular layers when forming coatings, linings, and the like. However, the materials are selected so that the deposited molecular layers do not adhere to the surface on which they are deposited, or are provided with a strippable coating. As a result the two components will have perfectly complementary surfaces providing a perfect precision fit. Thus, it becomes possible to provide between a pair of components, at least one of which is movable relative to the other, a perfectly precise fit.



3,712,339
REGULATING APPARATUS WITH THROTTLE GAPS

Reiner Bartholomaus; Dieter Diehl, both of Lohr/Main, Germany, and Conrad R. Himmler, deceased, late of Less Essarts Le Roi, France (by Irma Himmler, heiress), assignors to G. L. Rexroth Lohrer Eisenwerk, GmbH, Lohr/Main, Germany, a part interest, by said Bartholomaus and Diehl

Filed Nov. 10, 1970, Ser. No. 88,329
Int. Cl. F15b 9/03, 9/07, 9/12
U.S. Cl. 137—625.62 8 Claims



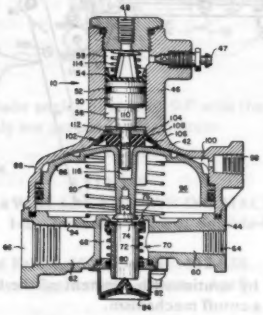
A baffle plate between two opposing nozzles is mounted on a flexible carrier which is secured to the armature of an electromagnet so that energization of the electromagnet by control signals causes variations of the throttle gaps between the nozzles and the baffle plate which causes a pressure differential between the discharge conduits of the nozzles. The discharge conduits communicate with chambers of a control slide valve which responds to the pressure differential. The pole shoes of the electromagnet are adjustable toward and away from the armature, and the nozzles are adjustable toward and away from the baffle plate so that irregular tolerances and outer influences on the control system can be compensated.

3,712,340

HYDRAULIC AND AIR OPERATED RELAY VALVE

Brian C. Deem, Avon Lake, Ohio, assignor to Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio

Filed March 19, 1971, Ser. No. 126,088
Int. Cl. F16k *31/12*
U.S. Cl. 137—627.5 4 Claims



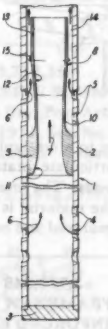
In a braking arrangement especially adapted for tractor-trailer vehicle brakes wherein the tractor includes hydraulically operated brakes and the trailer is equipped with compressed air operated brakes, the provision of a relay valve on the tractor for controlling the trailer brakes, the relay valve being selectively operable by hydraulic pressure when the tractor brakes are applied or by a separate source of compressed air carried by the tractor.

3,712,341

ANTICAVITATION DEVICE

Jean-Pierre Constantin, Grenoble; Jean-Claude Duquesne, and Michel Pontier, both of Aix en Provence, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 19, 1971, Ser. No. 107,744
Claims priority, application France, Feb. 13, 1970, 7005271
Int. Cl. F15d *1/06*
U.S. Cl. 138—44 2 Claims



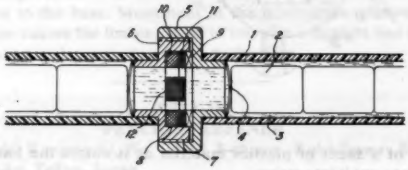
A flow separator is placed along the axis of a vertical duct and has a radial enlargement which is in contact with the internal duct wall. The duct is thus separated into a lower region and an upper region in which are located orifices for the admission of liquid under pressure. The radial enlargement is provided with an upward tubular extension which is so shaped internally as to form a highly progressive convergent-divergent nozzle while defining externally with the duct wall an annular space having at least one section which is partially throttled by a transverse diaphragm, said diaphragm being rigidly fixed to said tubular extension.

3,712,342

DEVICE FOR COMPENSATING FOR THE VARIATIONS OF THE VISCOSITY OF A FLUID IN A HYDRAULIC CIRCUIT DEPENDING ON ITS TEMPERATURE

Robert Lang, Claye Souilly, France, assignor to CIBIE Projecteurs, Bobigny, France

Filed Feb. 26, 1971, Ser. No. 119,320
Claims priority, application France, March 10, 1970, 7008523
Int. Cl. G05d *7/01*
U.S. Cl. 138—46 3 Claims



A compensating device for use in correcting for variations of viscosity in a hydraulic fluid comprising an apertured diaphragm construction of such a nature that the aperture is reduced in area when there is a temperature increase in the hydraulic fluid.

ERRATUM

For Class 138—145 see:
Patent No. 3,712,317

3,712,343

HAND GRIPS

William J. Sparks, 5129 Granada Blvd., Coral Gables, Fla.

Filed Dec. 21, 1970, Ser. No. 99,999
Int. Cl. A03b *53/14*
U.S. Cl. 138—177 1 Claim

This invention relates to grips for hand operated equipment, especially golf clubs, in which a shaft or rod portion is covered by a sleeve of an elastomeric or plastomeric material. Tubular double grip structures are extruded or molded. Tubular products having recurring double grip structures are programmed so as to be extruded according to a prearranged schedule. From the double grip structure individual grip sections are cut with a length and outside diameter to meet the needs of a particular individual.

3,712,344

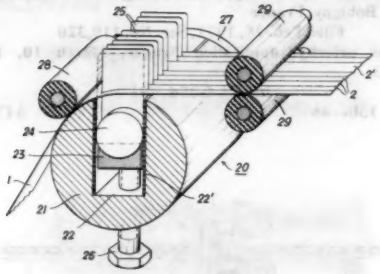
STRIP CUTTING UNIT FOR LOOMS

Viktor Kovacec, Lainzerstrasse 45, Vienna, Austria

Continuation of Ser. No. 839,333, July 7, 1969, abandoned.
This application July 7, 1971, Ser. No. 160,535
Claims priority, application Austria, July 23, 1968, A 7137
Int. Cl. D03d *49/00*
U.S. Cl. 139—11 5 Claims

The present invention provides a loom for making netting from strips of plastics material and a novel cutting unit for use

therewith. The cutting unit has a number of mutually parallel blades arranged in a channel in a beam and is disposed in the



path of a sheet of plastics material as it enters the loom in order to cut it into strips.

3,712,345

YARN CLAMPING MECHANISM

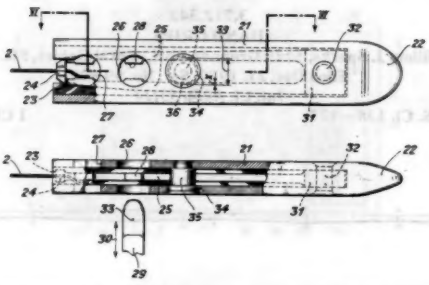
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed May 14, 1971, Ser. No. 143,530

Claims priority, application Switzerland, May 29, 1970, 8055/70

Int. Cl. D03j 5/06

U.S. Cl. 139—125 13 Claims



The clamping mechanism is provided with a stop member against which the clamp arms abut upon closing of the jaws. The stop member and arms are dimensioned so that a fraction of the spring force biasing the arms closed is absorbed by the stop member. The stop member can be mounted on the bearer member carrying the clamp or on the clamp arms. Also, the stop member can be of various geometric forms.

3,712,346

STRAP TIGHTENING AND CUTTING TOOL

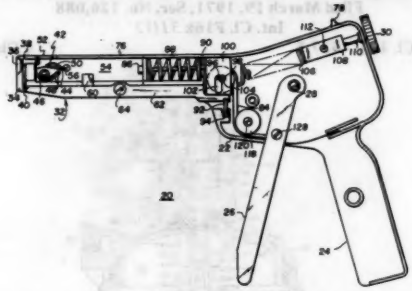
Peter Noorily, Holliswood, N.Y., assignor to Thomas and Betts Corporation, Elizabeth, N.J.

Filed March 26, 1971, Ser. No. 128,238

Int. Cl. B21f 9/02

U.S. Cl. 140—123.6 21 Claims

A strap tightening and cutting tool operated by a cable-roller mechanism. The roller is preset by a tensioning mechanism in such a manner as to permit the cable to freely pass over the surface of the roller during the tightening operation. When the tension applied to the strap is equal to the preset tension upon the roller, the roller is displaced from its



normal axis by continued movement of the cable to contact and operate a cutoff mechanism.

3,712,347

METHOD AND APPARATUS FOR FILLING TRAYS

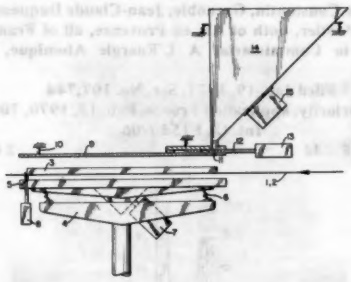
Borge Christian Andersen, Gullandsgade 35, Copenhagen, Denmark

Filed Aug. 10, 1970, Ser. No. 62,599

Claims priority, application Denmark, Aug. 8, 1969, 4279/69

Int. Cl. B65b 1/04, 3/04

U.S. Cl. 141—12 6 Claims



The invention relates to a method and apparatus for filling trays with discrete particulate material, particularly granulated freeze-drying goods. The method and apparatus are characterized in that the material is vibrated to fill the space between a tray for the material and cover plate for the tray.

3,712,348

SAW BLADE FOR A FRAME SAW HAVING TEETH WITH REINFORCED EDGES

Leo Kulik, and Gustav Gustenau, both of Wien 10, Austria, assignors to Firma Franz Lipowsky Sagen-u.Maschinen-messerfabrik, Wien, Austria

Filed Jan. 13, 1971, Ser. No. 106,014

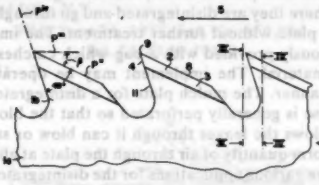
Claims priority, application Austria, Jan. 14, 1970, A 346/70

Int. Cl. B27b 33/04

U.S. Cl. 83—835 5 Claims

A saw blade for a frame or gang saw has teeth each formed with a reinforced edge region. This region has a planar upper surface inclined rearwardly and inwardly away from a cutting direction and a pair of planar flank surfaces converging

backwardly in the cutting direction and each defining a locus of lines perpendicular to the cutting direction whereby the



lateral flanks include angles of at least 90° with the upper surface and preferably are perpendicular thereto.

3,712,349

ROTARY SAW BLADE FOR SAWING MACHINE

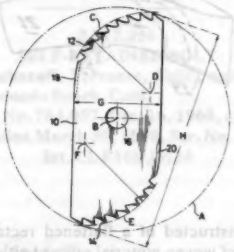
Kinzo Toki, No. 1-2, 2-chome, Yahiro, Sumida-ku, Tokyo, Japan

Filed Feb. 4, 1971, Ser. No. 112,638

Claims priority, application Japan, April 25, 1970, 45/40822

Int. Cl. B27b *33/02*

U.S. Cl. 83—848 **4 Claims**



A rotary saw blade for sawing machine is formed into substantially rhomboidal shape providing symmetrically saw teeth of different pitches at confronted diagonal ends and two guide edges at diagonally opposite corners of confronted sides. A series of teeth provided at one diagonal end are somewhat arched to one direction while series of the teeth provided at the other diagonal end are somewhat arched to the counter direction.

3,712,350

LIMBING BOOM

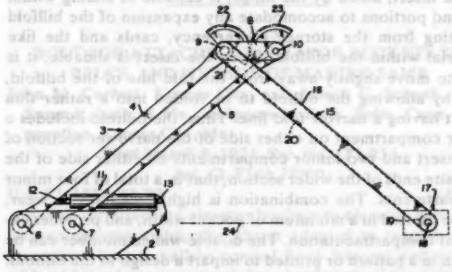
John E. Eynon, 103 Sunset Bay, Port Arthur, Ontario, Canada

Filed Aug. 2, 1971, Ser. No. 168,323

Claims priority, application Canada, Aug. 11, 1970, 090,432

Int. Cl. A01g *23/02*

U.S. Cl. 144—2 Z **7 Claims**



A limbing assembly for removing limbs from a stationary tree includes a base with a pair of parallel inner arms pivotally connected to the base. Means are provided for pivoting the inner arms relative to the base with means for maintaining the inner arms in their parallel relationship during such pivotal movement. A first arcuately-surfaced member is rigidly secured to one inner arm, a shaft is rotatably mounted in the other inner arm, and a second arcuately-surfaced member is rigidly secured to the shaft. The arcuate surfaces of the members are engaged with one another in driving relationship. An outer arm is rigidly secured at one end to the shaft. The outer arm has a length equal to the length of the other inner arm between the shaft and the base. A second shaft is rotatably mounted at the other end of the outer arm with a limbing head rigidly secured to the shaft. Means connecting the first and second shafts cause the second shaft to move through the same angle relative to the outer arm as the inner arms move relative to the base. Movement of the inner arms relative to the base causes the limbing head to travel in a straight line at a constant angular attitude relative to the base.

3,712,351

PENCIL SHARPENER

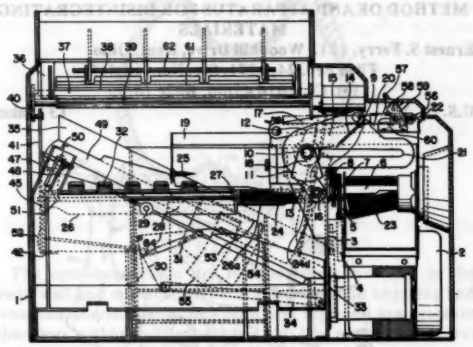
Shigeaki Kuramochi, No. 24-17 5-chome, Koishikawa, Bunkyo-ku, Tokyo, Japan

Filed June 2, 1970, Ser. No. 42,617

Claims priority, application Japan, June 3, 1969, 44/43842; June 3, 1969, 44/52344

Int. Cl. B43l *23/02*

U.S. Cl. 144—28.72 **3 Claims**



A pencil sharpener comprising a blade, a feed member for feeding a pencil to said blade and withdrawing a sharpened pencil from said blade in association with the pencil sharpening operation, a holder provided in said feed member for holding a pencil in association with the operation of said feed member, a guide member operated in association with the pencil sharpening operation for guiding a pencil to the pencil holding position of said holder, and supply means for successively supplying one pencil at a time to said guide member in association with the pencil sharpening operation. The pencil sharpener is characterized in that one pencil after another can be successively sharpened.

3,712,352

DEPTH ADJUSTERS AND INTERCHANGEABLE LOCATORS FOR SCREWDRIVERS

Gary S. Lafferty, Sr., Milwaukee, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

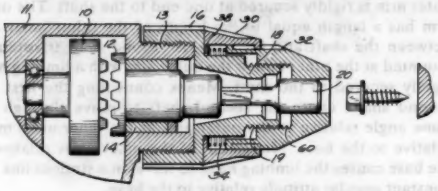
Filed May 6, 1971, Ser. No. 140,728

Int. Cl. B25b *21/00*

U.S. Cl. 144—32 **7 Claims**

A depth adjuster made of injection molded plastic parts has a bit housing which screws onto the projecting externally threaded nose on the gear housing of a standard electric powered hand tool provided with a positive pressure engaged

clutch. The bit housing has a bore to accommodate the clutch chuck and the shank of a bit for a screw head. The bore passes through an extending neck on the bit housing which is externally threaded and provided with an outwardly facing shoulder having locking tabs. Onto this neck is threaded a locator assembly of a type designed for a particular application. This assembly has three parts which are snapped into



place and remain assembled even when disconnected from the bit housing. These parts consist of (1) a locking collar with locking slots which engage with the locking tabs, (2) a locator sleeve which has limited axial movement and a non-rotative movement with respect to the locking collar, and (3) a compression spring which axially urges the locking collar rearwardly toward the outer extreme of its limited motion with respect to the locator sleeve.

3,712,353

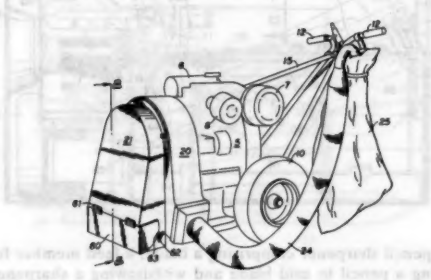
METHOD OF AND APPARATUS FOR DISINTEGRATING MATERIALS

Ernest S. Ferry, 1213 Woodhill Drive, Kent, Ohio

Filed Feb. 24, 1971, Ser. No. 118,447

Int. Cl. A01d *43/00*; B02c *18/00*

U.S. Cl. 241—27 **13 Claims**



A disintegrator is composed of (1) a mulch plate with one or more raised diffusers composed of evenly spaced bars rising from the plate with spaces between them, and (2) one or more mulch bars each composed of a bar with teeth projecting from one surface spaced to pass through the spaces between the bars of the diffusers. The mulch bar is positioned to rotate with respect to a fixed location on the mulch plate so that the teeth will pass through the spaces between the bars of the one or more diffusers. The plate may be perforated or imperforate. In the preferred disintegrator, one or more narrow portions of the mulch plate in areas extending substantially radially from said fixed location are fabricated into diffusers. The bars and spaces of each diffuser are arranged substantially circumferentially of said fixed location so that the teeth of the mulch bar pass through them as it is rotated. The spaces between the bars of the diffuser extend through the plate, either as one long opening under the entire diffuser (which is the case when the diffuser is fabricated separately from the plate) or as separate openings (which may be the case when the diffuser is formed from the plate).

The disintegrator is a multi-purpose disintegrator and is well suited for use in an implement such as an outdoor-area cleaner provided with a fan which sucks or blows leaves, twigs, etc. from an area such as a lawn, drive, parking area, etc. against the front face of the disintegrator where the teeth of the one or more mulch bars push them to, and through the spaces in a diffuser where they are disintegrated and go through the opening in the plate without further treatment. The implement is advantageously provided with a bag which catches the disintegrated material. The implement may be operated in any suitable manner. The mulch plate for a disintegrator used for this purpose is generally perforated so that the blower which sucks or blows the leaves through it can blow or suck a relatively uniform quantity of air through the plate at all times.

There are various applications for the disintegrator.

3,712,354

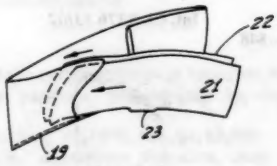
BILLFOLD

Mark R. Lovendale, 6431 Monterey Road, Los Angeles, Calif.

Filed Sept. 22, 1971, Ser. No. 182,671

Int. Cl. A45c *1/06*

U.S. Cl. 150—38 **7 Claims**



A billfold constructed of a flattened rectangular double-walled member of woven material open at either end and having a central portion and opposite end portions which are folded to overlay a major extent of the central portion to form the main body member of the billfold. The central portion may be reinforced by a flat flexible plastic member positioned at the central portion prior to folding the end portions. The one edge of each folded end portion is secured to the contiguous edge of the central portion to complete the body member of the billfold.

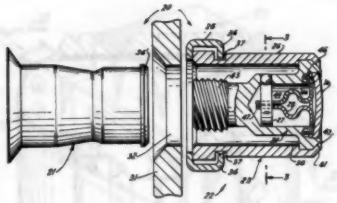
An insert is provided having a wider section and a narrower section interconnected by a hinge. The sections are folded over one another at the hinge and the opposite ends of the wider section are inserted into the oppositely facing open ends of the end portions. The narrower section is positioned within the central portion of the body member and the hinge lies between the end portions externally of the body member. The inset cooperates with the body member of the billfold to form two major compartments each of a length equal to the central portion of the body member.

The insert, aided by the hinge, is capable of sliding within the end portions to accomodate any expansion of the billfold resulting from the storage of currency, cards and the like material within the billfold. Since the insert is slidable, it is able to move slightly away from the fold line of the billfold, thereby allowing the billfold to be folded into a rather thin wallet having a narrow fold line. Thus, the billfold includes a major compartment on either side of the narrower section of the insert and two minor compartments on either side of the opposite ends of the wider section, that is, a total of four minor compartments. The combination is highly resistant to wear, can be carried in a minimum of pocket width, and provides excellent compartmentation. The double-walled member can be woven in a pattern or printed to impart a design to the billfold. Manufacturing steps are few and uncomplicated so that the billfold is exceptionally inexpensive to produce in quantities to further reduce the overall manufacturing costs of the billfold.

3,712,355
FLUSH ROTARY FASTENER

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed June 23, 1971, Ser. No. 155,904
Int. Cl. F16b *39/00*
U.S. Cl. 151—2 7 Claims

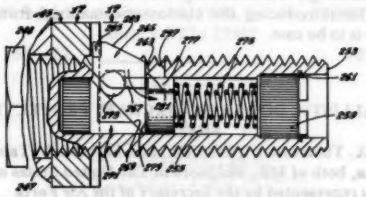


A rotary fastener assembly for joining two members having infinite locked positions and which requires a minimum turning torque to reach the desired locked position and a substantially greater turning torque to unlock the assembly and permit the fastener to be easily disassembled thereafter.

3,712,356
SELF-RETAINED BOLT

George J. Petroshanoff, Torrance, Calif., assignor to Tridair Industries, Redondo Beach, Calif.

Division of Ser. No. 784,057, Dec. 16, 1968, abandoned. This application March 30, 1970, Ser. No. 29,319
Int. Cl. F16b *39/28*
U.S. Cl. 151—6 6 Claims



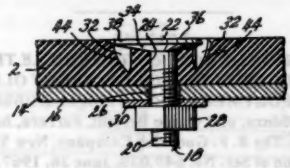
This disclosure describes a self-retained bolt which may include a head, a shank having threads thereon, a pawl mounted for generally radial movement within the shank and means for biasing the pawl radially outwardly. A nut can be threaded onto the bolt for cooperation therewith in securing together two or more members. The pawl acts in various ways to prevent inadvertent separation of the nut and bolt and/or the bolt and the members being fastened together.

3,712,357
BOLT FOR ATTACHING ELEVATOR BUCKETS TO BELTS, AND METHOD OF MAKING SAME

John M. Corbett, Kansas City, and Joseph G. Schenk, Lee's Summit, both of Mo., assignors to Belts, Bolts, Cups, Corporation, Kansas City, Mo.

Filed March 8, 1971, Ser. No. 122,034
Int. Cl. F16b *39/00*
U.S. Cl. 151—41.73 1 Claim

A bolt for attaching elevator buckets to elevator belts, said bolt comprising a threaded shank adapted to receive a nut thereon, a broad shallow conical head integral and coaxial with said shank, and a pair of sharpened teeth of special shape carried by said head at diametrically opposite sides of and in spaced relation from said shank and extending from said head in the direction of said shank, and a method of forming each of said teeth consisting of cutting said head from the periphery

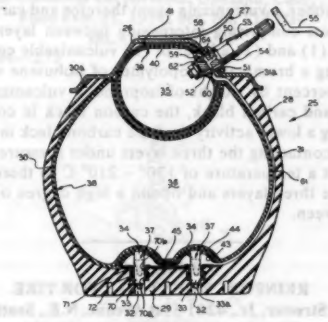


thereof along a line acutely angled to the adjacent edge thereof, and forming a right angled bend along a line from the inner end of said cut to the adjacent edge of said head.

3,712,358
PNEUMATIC ANTI-SKID VEHICLE TIRE

Einar Einarsson, Mavahlio 8, Reykjavik, Iceland

Filed Sept. 8, 1970, Ser. No. 70,324
Int. Cl. B60c *11/00*
U.S. Cl. 152—208 16 Claims

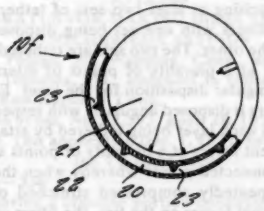


The anti-skid vehicle tire includes studs mounted in the tread wall and movable between extended road engaging and retracted non-road engaging positions, high and low pressure chambers within the tire wherein the low pressure chamber maintains the tire in inflated condition, pressure responsive expansible means coacting with the studs to control stud position, and valve means for selectively intercommunicating the expansible means with the high pressure air chamber and atmosphere to retract and extend the studs.

3,712,359
CRAZY TIRES

Victor E. Williams, 3662 77th Place, Merrillville, Ind.

Filed March 16, 1971, Ser. No. 124,817
Int. Cl. B60c *19/00*
U.S. Cl. 152—352 1 Claim



An amusement tire for a vehicle so as to give a pleasure ride that is bumpy, the tire including an outer periphery that is not

perfectly round but which is bump configurated in any of various designs such as being octagonal, scalloped, toothed, or wherein the bumps of any shape are of various different heights on a single tire.

3,712,360

PRODUCTION OF COMPOSITE VEHICLE TIRES BY COVULCANIZATION OF LAYERS OF OLEFIN TERPOLYMERS AND NATURAL RUBBER

Luigi Torti, Monza, and Guido Bertelli, Ferrara, both of Italy, assignors to The B. F. Goodrich Company, New York, N.Y.

Continuation of Ser. No. 649,039, June 26, 1967, Pat. No. 3,580,800. This application Nov. 2, 1970, Ser. No. 86,269

Claims priority, application Italy, June 28, 1966, 14823/66; Canada, June 27, 1967, 994063; France, June 27, 1967, 112,041; Great Britain, June 26, 1967, 29,397/67; Japan, June 27, 1967, 40/40812; Germany, June 23, 1967, P 16 94 628.4. The portion of the term of this patent subsequent to May 25, 1988, has been disclaimed.

Int. Cl. C09j 3/12

U.S. Cl. 152—354 **4 Claims**

Process for bonding (1) vulcanizable composition comprising low-unsaturation ethylene/higher alpha-olefin/unconjugated diolefin terpolymer, a vulcanizing agent therefor and carbon black with (2) vulcanizable composition comprising natural rubber, a vulcanizing agent therefor and carbon black, this process comprising interposing between layers of compositions (1) and (2) a layer of (3) vulcanizable composition comprising a brominated copolymer of isobutene with about 0.5 – 5 percent by weight of isoprene, a vulcanizable agent therefor and carbon black, the carbon black in composition (3) having a lower activity than the carbon black in layers (1) and (2), contacting the three layers under pressure, and then heating at a temperature of 130° – 210° C to thereby covulcanize the three layers and obtain a high degree of adhesion therebetween.

3,712,361

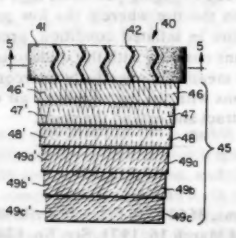
REINFORCEMENT MAT FOR TIRE

Daniel D. Streeter, Jr., 4201 51st Avenue, N.E., Seattle, Wash.

Filed Oct. 20, 1970, Ser. No. 82,423

Int. Cl. B60c 9/10

U.S. Cl. 152—356 **13 Claims**



A tire construction comprising an inner reinforcement mat having a plurality of tethered but free sliding fiber layers, each fiber layer comprising at least two sets of tethered but free sliding parallel fibers with one set being disposed angularly with respect to the other. The two sets are tethered by connections connected at a plurality of points of intersection and define a mean angular disposition for the layer. Each successive layer of fibers is disposed angularly with respect to the adjacent layer with each layer being tethered by attachments attached to adjacent layers at a plurality of points spaced from the fiber sets connected points whereby when the reinforcement mat is repeatedly compressed stretched or flexed or stressed by external forces on the tire, the fibers of each layer will reversibly tend to mesh and unmesh with fibers of adjacent layers.

3,712,362

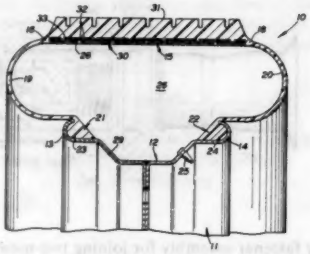
A PNEUMATIC TIRE WITHOUT BEAD REINFORCEMENT RINGS

Sterling W. Alderfer, 464 N. Portage Path, Akron, Ohio

Filed Oct. 1, 1970, Ser. No. 77,133

Int. Cl. B60c 9/20

U.S. Cl. 152—361 **10 Claims**



A molded tire and method for producing such a tire. The tire has a generally conventional horseshoe shaped cross section including a tread supporting wall bounded by shoulders from each of which a side wall extends radially inwardly to terminate in a bead foot that requires no reinforcement to impart the hoop strength necessary to retain the tire on a rim. The required hoop strength is imparted by a substantially inextensible belt that is encased within or around the tread supporting wall portion. Inasmuch as the beads need not be reinforced in the customary sense they may each well present a heel for engagement by the opposed hook flanges on a clincher type rim. A tire embodying the foregoing construction may be molded by positioning the reinforcing belt within a mold cavity and thereafter introducing the elastomeric material from which the tire is to be cast.

3,712,363

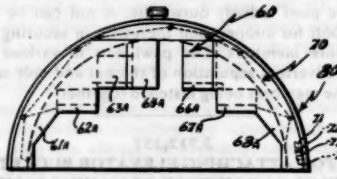
BALLISTIC DOOR FOR AIRCRAFT PROTECTIVE SHELTER

Erwin A. Thomassen, Timonium, and Maurice L. Tabickman, Joppa, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Aug. 11, 1969, Ser. No. 851,147

Int. Cl. E06b 5/10

U.S. Cl. 160—113 **2 Claims**



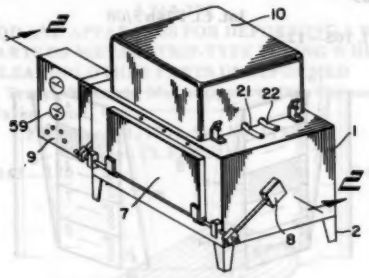
A ballistic door for an open-ended aircraft protective shelter. The door includes fixed upper and movable lower portions, both of 2 × 2 basket weave ballistic protective nylon of at least 12 plies, and means for raising and moving each movable portion to form an opening having a contour conforming to the configuration of the aircraft to be housed within the protective shelter. An end cover of water impervious flexible material may be used external of the ballistic door for protection against the weather.

3,712,364

METHOD OF VACUUM CASTING METAL

Arnold Daniel, 2219 Devonshire Drive, and Joseph B. Richey, II, 2160 Demington Drive, both of Cleveland Heights, Ohio

Filed Nov. 25, 1970, Ser. No. 92,583
Int. Cl. B22d 27/16
U.S. Cl. 164—4 10 Claims



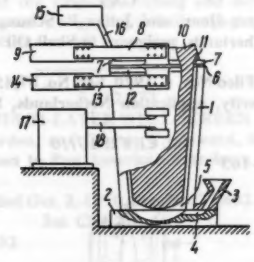
A metal casting system especially adapted for the rapid melting and casting of small charges of metal, utilizing resistance heating of such charge and immediate delivery of the molten metal to a suction mold.

3,712,365

ELECTROSLAG PROCESS FOR THE PRODUCTION OF METAL CASTINGS

Boris Evgenievich Paton, ulitsa Kolsjubinskogo 9, kv. 21; Boris Izrailevich Medovar, Bulvar Lesi Ukrainki 2, kv. 8; Jury Vadimovich Latash, Vazdukhoflotsky prospekt, 87, kv. 14, and Vitaly Mikhailovich Baglai, ulitsa Semashko 10, kv. 54/3, all of Kiev, U.S.S.R.

Continuation of Ser. No. 707,088, Feb. 21, 1968, abandoned. This application Nov. 30, 1970, Ser. No. 93,887
Int. Cl. B22d 27/02
U.S. Cl. 164—52 45 Claims



A process of operating an electric furnace as set out wherein the electrode is melted within the furnace mold by application of electric current while the electrode is held in a fixed axial position. The molten slag bath is maintained in contact with the electrode during melting thereof.

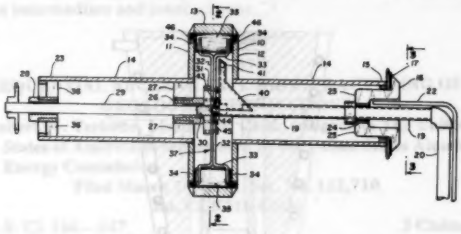
3,712,366

METHOD OF COOLING DRUM TYPE STRIP CASTING APPARATUS

Charles Christian Gerding, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1971, Ser. No. 188,049
Int. Cl. B22d 11/06; F28d 11/08
U.S. Cl. 164—87 2 Claims

An internally liquid cooled rotatable drum open to the atmosphere for continuously solidifying molten metal on its outer surface is provided with a coaxially rotating spider carrying rollers in radial slots which under the action of centrifugal force roll on the drum inner surface. The spider is rotated at a speed sufficient to throw a rotating layer of cooling liquid



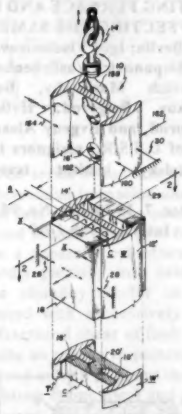
against the inside surface of the drum by centrifugal force, and the action of the rollers on the surface being cooled breaks up incipient film boiling.

3,712,367

CLADDING MOLD SYSTEM

Dietmar G. Plichta, Oakland, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 11, 1971, Ser. No. 114,634
Int. Cl. B22d 11/00
U.S. Cl. 164—275 16 Claims



Improved mold system for cladding an elongated metallic rail element and the like wherein a unique biasingly mounted cladding die is employed which automatically adjusts itself to the contour of the rail despite variations in such rail contour as the rail moves past the die during cladding.

3,712,368

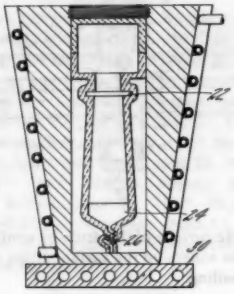
APPARATUS FOR MAKING DIRECTIONALLY SOLIDIFIED CASTINGS

Charles M. Phipps, Jr., Wapping, Conn., and Raymond R. Boucher, Tequesta, Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 32,593, April 28, 1970, Pat. No. 3,667,533. This application Dec. 1, 1971, Ser. No. 203,681
Int. Cl. B22d 41/04
U.S. Cl. 164—336 4 Claims

A mold having a crucible portion connecting with the article forming portion is positioned within a tapering susceptor heated by a surrounding induction coil and the susceptor serves to control the temperature gradient during the solidifi-

cation of the alloy in the mold. The crucible is located at the bottom of the assembly until the alloy is melted and the entire



assemblage is then inverted to cause the molten alloy to flow into the article portion of the mold, the latter being preferably positioned on a chill plate.

3,712,369

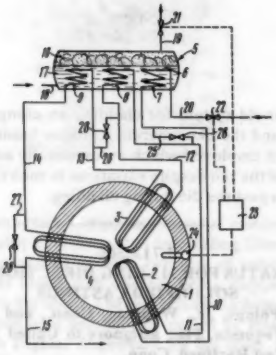
METHOD FOR REMOVING HEAT FROM FLUIDIZED BED OF ROASTING FURNACE AND DEVICE FOR EFFECTING THE SAME

Zalman Leivikovich Berlin; Igor Vladimirovich Tsarev, both of Moscow; Anatoly Stepanovich Vasilchenko, Konstantinovka; Gennady Vasilievich Maslovsky, Belgorod; Anatoly Gavrilovich Serkov, Belgorod; Hviktor Yakovlevich Yakimovich, Belgorod, and Evgeny Alexandrovich Ivanovsky, Moscow, all of U.S.S.R., assignors to Gosudarstvenny nauchno-issledovatelsky institut tsvetnykh metallov, Moscow, U.S.S.R.

Filed Dec. 7, 1970, Ser. No. 95,790

Int. Cl. B60h *1/00*

U.S. Cl. 165—1 **1 Claim**



A method for removing heat from a fluidized bed of a roasting furnace and a device for carrying this method into effect by means of steam-cooled tubular members, which provide for an increase in the heat absorption of these members through preliminary cooling of the steam fed thereinto up to saturation or wet state.

3,712,370

RADIAL-FLOW HEAT EXCHANGER

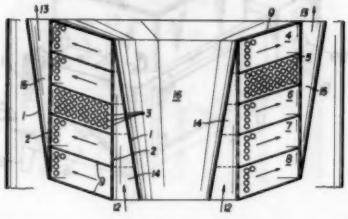
Paul Viktor Gilli, Vienna; Kurt Fritz, Klosterneuburg; Josef M. Lippitsch, Graz, all of Austria, and Gunther Lurf, Stuttgart, Germany, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria

Filed Sept. 22, 1970, Ser. No. 74,357

Claims priority, application Austria, Sept. 26, 1969, A 9159/69

Int. Cl. F24h *3/06*

U.S. Cl. 165—125 **17 Claims**



A radial-flow heat exchanger where tubes through which one heat-exchanging fluid flows surround a given axis while a second heat-exchanging fluid flows across the exterior of these tubes radially with respect to the latter axis. Fluid-guides are provided for this other fluid so as to achieve at the exterior of the tubes a substantially uniform through-flow in all axial sections of the heat exchanger. The fluid-guides may include inner and outer tubular walls which taper in the same direction and define with inner and outer regions of the tubes receiving and discharge chambers for the fluid which flows radially, the receiving chamber having an inlet which forms the largest cross section of the receiving chamber while the discharge chamber has an outlet which forms the largest cross section for the discharge chamber.

3,712,371

METHOD FOR HEAT RECOVERY FROM SYNTHESIS GAS

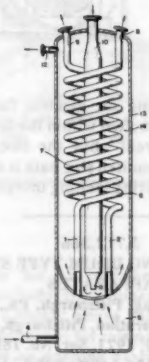
Leonard W. ter Haar, and Johan P. Schungel, both of The Hague, Netherlands, assignors to Shell Oil Co., New York, N.Y.

Filed Nov. 6, 1970, Ser. No. 87,451

Claims priority, application Netherlands, Nov. 11, 1969, 6916941

Int. Cl. F28d *7/10*

U.S. Cl. 165—163 **4 Claims**



An improved method and apparatus for cooling and recovering heat from soot-containing hot gases obtained by the partial combustion of hydrocarbons is disclosed. The im-

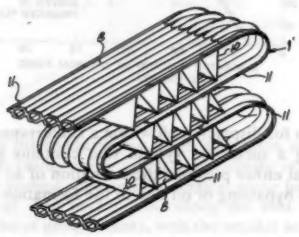
provement comprises partly cooling the hot gases by flowing them through one or more straight tubes of at least two meters in length at a mass velocity of at least 100 kg/m²/sec. The gases are subsequently further cooled in one or more helically coiled tubes connected to the straight tubes. The invention is particularly suitable for generating high pressure steam from hot gases obtained at moderate as well as high pressures.

3,712,372

METHOD AND APPARATUS FOR DEFORMING A FLAT ON PARTS OF METAL STRIP-TYPE TUBING WHILE LEAVING OTHER PARTS UNDEFORMED

Lester J. Tranel, St. Louis, Mo., assignor to Olin Corporation, New Haven, Conn.

Filed March 1, 1971, Ser. No. 119,600
Int. Cl. F28f *3/14*
U.S. Cl. 165—170 6 Claims



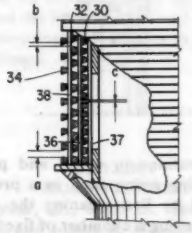
A method and apparatus for forming metal strip-type tubing suitable for use in heat exchangers. Deforming flats are formed on parts of a first surface and an opposing surface of the tubular passageways in the strip-type tubing while other parts of the tubing are left undeformed. The deformed flats are adapted to be bonded to flat type fin stock for heat exchanger applications. The undeformed areas of the tubing are adapted to be bent without a significant pressure drop occurring in the bend area. The apparatus includes means for deforming the flat on the tubular passageways while restraining the edges of the strip-type tubing and further includes means for sequentially engaging and disengaging the deforming means from contact with the tubing.

3,712,373

MULTI-LAYER WELL SCREEN

William G. Bearden, and George C. Howard, both of Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla.

Filed Oct. 2, 1970, Ser. No. 77,492
Int. Cl. E21b *43/08*
U.S. Cl. 166—232 8 Claims



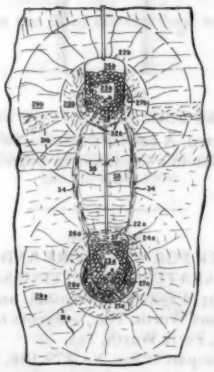
This is a special downhole multi-layer sand screen for oil and other fluids containing sand. The preferred embodiment of the sand filter includes an outer screen, an intermediate screen and an inner screen although another embodiment may have only an outer and an inner screen. The outermost screen is of larger spacing to retain only the coarser sand particles and the openings in the inner two screens are progressively smaller to retain the less coarse sand material. The coarser sand particles bridge about the larger openings in the outer screens and progressively finer sand materials bridge across the intermediate and inner screens.

3,712,374

SEQUENTIAL NUCLEAR EXPLOSION FRACTURING OF GEOLOGICAL FORMATIONS

Robert W. Terhune, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed March 10, 1971, Ser. No. 122,710
Int. Cl. E21b *43/26*
U.S. Cl. 166—247 3 Claims



A vertically spaced series of nuclear explosive devices are emplaced in a subterranean formation and the lowermost explosive is detonated first to provide a nuclear chimney having an apical void spaced therein. The next higher device is then detonated to cause a generally cylindrical plug region to be displaced downwardly partially into said void space while creating a nuclear chimney similar to the first and the procedure is repeated with successively higher of the emplaced devices. A fractured shear of fault zone surrounds the cylindrical plug while an extensive pattern of radial fractures are created thereabout as well as about the shot cavity and associated chimney. More economical and effective results can be obtained as required, e.g., in stimulating production from petroliferous formations.

3,712,375

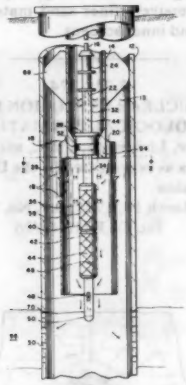
METHOD FOR CATALYTICALLY HEATING WELLBORES

Holland J. Berry; William C. Hardy, and Dale W. Zadow, all of Richardson, Tex., assignors to Sun Oil Company, Dallas, Tex.

Continuation-in-part of Ser. No. 889,059, Dec. 30, 1969, abandoned. This application Nov. 25, 1970, Ser. No. 92,836
Int. Cl. E21b *43/24*
U.S. Cl. 166—251 10 Claims

A catalytic heater is used in supplying heat to wellbores and has a catalytic surface open to the wellbore for contacting and causing the reaction of a fuel mixture. The preferable catalytic material is platinum supported on a matrix of asbestos, asbestos-burlap, ceramic, or other non-combustible material. Air and fuel gas is injected into the wellbore to contact the catalyst. Initiation of a catalytic reaction is brought about by use of a fuel gas containing hydrogen which will spontaneously react with air at standard conditions in the presence of the

catalyst. Once the hydrogen-air reaction reaches the reaction temperature of a hydrocarbon fuel gas and air, hydrogen in-



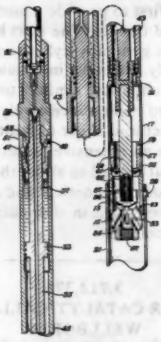
jection is terminated. A carrier fluid may be used to transport the heat of reaction to a formation or other appropriate location.

3,712,376

CONDUIT LINER FOR WELLBORE AND METHOD AND APPARATUS FOR SETTING SAME

Harrold D. Owen; Wayne O. Rosenthal, and James Douglas Young, all of Fort Worth, Tex., assignors to Gearhart-Owen Industries, Inc., Forth Worth, Tex.

Continuation-in-part of Ser. No. 878,108, Nov. 19, 1969, abandoned. This application July 26, 1971, Ser. No. 166,066
Int. Cl. E21b *23/04, 43/10*
U.S. Cl. 166—277 **39 Claims**



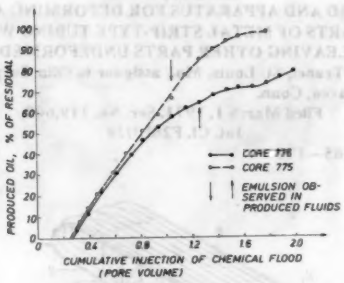
A method of emplacing a liner in a conduit in a well penetrating subterranean formations characterized by positioning with a wire line a cylindrical annular liner at a given depth in the well, the liner being disposed adjacent a swaging mandrel and a setting sleeve, both being connected with a setting tool; actuating the charge in the setting tool to force the swaging mandrel through the liner and to oppose movement of the liner by a reactive force on the setting sleeve, thereby expanding the liner outwardly into tight frictional engagement with the conduit without requiring an anchor or supplemental support; and removing the other apparatus from the well. Also disclosed are specific arrangements and combinations of respective embodiments and some of the uses of the liner.

3,712,377

OIL RECOVERY PROCESS USING AN EMULSION MODIFIER-CONTAINING DILUTE AQUEOUS SURFACTANT SYSTEM

Harold J. Hill, and David Ross Thigpen, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 26, 1971, Ser. No. 192,129
Int. Cl. E21b *43/22*
U.S. Cl. 166—252 **25 Claims**


PRODUCED OIL, % OF RESIDUAL
CORE 776
CORE 775
EMULSION OBSERVED IN PRODUCED FLUIDS
CUMULATIVE INJECTION OF CHEMICAL FLOOD (PORE VOLUME)

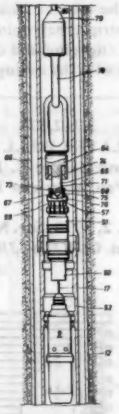
A process for displacing oil within a subterranean reservoir by injecting a surfactant system that contains an emulsion modifier that either prevents the formation of an emulsion or reduces the bypassing of oil due to the formation of an emulsion.

3,712,378

WIRE LINE METHOD AND APPARATUS FOR CLEANING WELL PERFORATIONS

Donald A. Olivier, Kenner, La., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 1, 1971, Ser. No. 185,614
Int. Cl. E21b *43/25*
U.S. Cl. 166—299 **11 Claims**



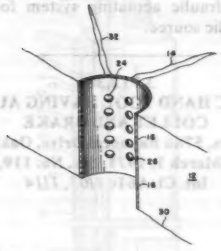
Sand control operations in cased and perforated wells equipped with a tubing string such as a production tubing string, are improved by first cleaning the perforations by lowering a tool comprising a chamber of fixed volume, an actuator for rapidly opening the chamber, and a means for packing off the tubing string above the production interval into the well on a wire line; packing off the interval adjacent the perforations; and rapidly opening the chamber into fluid communication with fluids in the wellbore to surge fluid from the surrounding earth formation through the perforations and into the well.

3,712,379

MULTIPLE FRACTURING PROCESS

William L. Hill, Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed Dec. 28, 1970, Ser. No. 101,894
Int. Cl. E21b *43/26*
U.S. Cl. 166—297 13 Claims



A process for fracturing an earth formation includes perforating well casing along a first substantially vertical plane, and along a second substantially vertical plane located in the same interval. The perforations along the first and second planes may be of unequal sizes, with the smaller set of perforations located adjacent the zone of preferential fracturing. The smaller set of perforations are sized to insure that a fracturing fluid will enter the larger set of perforations after fracturing occurs in the preferential fracture zone.

3,712,380

METHOD FOR REWORKING AND CLEANING WELLS

Paul N. Caffey, Box 235, Hennessey, Okla.

Filed Nov. 30, 1970, Ser. No. 93,859
Int. Cl. E24b *43/25*
U.S. Cl. 166—300 6 Claims

A method for reworking and cleaning a well which comprises the steps of setting a packer in the well bore above the formation surrounding the well bore to be treated, inserting tubing through the packer, pumping a mixture of calcium carbide in a liquid hydrocarbon carrier into the area of the well bore to be treated, pumping a hydrocarbon through the tubing to force all of the calcium carbide and liquid hydrocarbon carrier into the area to be treated, pumping an aqueous solution of hydrochloric acid through the tubing, packer and into the well bore and surrounding formation, pumping a liquid hydrocarbon into the tubing to force the calcium carbide, the hydrocarbons and the hydrochloric acid into the formation to be treated, and securing the well bore to prevent escape of the reactants, is disclosed.

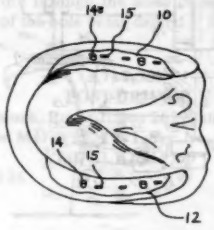
3,712,381

HORSESHOEING

William A. Fryrear, Jr., 8820 St. Anthony Church Road, Louisville, Ky., and Joseph R. Metcalf, 914 Flintlock Drive, Louisville, Ky.

Division of Ser. No. 869,616, Oct. 27, 1969, abandoned. This application Nov. 16, 1971, Ser. No. 199,253
Int. Cl. A01l *1/00*
U.S. Cl. 168—4 4 Claims

In the case of horses, particularly thoroughbreds, hoof care has not advanced along with careful breeding, scientific feeding and exercising, training methods and medical conditioning. A custom, and hence a perfectly fitting, horseshoe can be made. In addition the fit of conventional horseshoes can be improved.

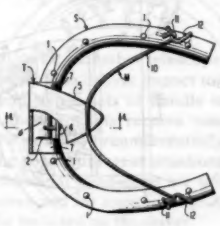


3,712,382

HORSE OR THE LIKE SHOE DEVICE

Maurice Stubblefield, Clancy, Mont.

Filed March 18, 1971, Ser. No. 125,598
Int. Cl. A01l *3/04*
U.S. Cl. 168—22 8 Claims



A horse or the like shoe device, readily attachable to and removable from a hoof, comprises a first hook formed with an upwardly convex flange on a shoe part toe portion closed at its top and curled rearwardly, downwardly and forwardly in the toe portion and opening toward the bottom of the shoe part, and a toe piece provided with a second hook having an upwardly convex flange and being curled correspondingly to the curl of the first hook flange and interengageable with the first hook for removably connecting the toe piece to the shoe part. Means such as a bail engages the toe piece and is connected to the rear of the shoe part for maintaining the toe piece in contact with the hoof front and for retaining the hooks interengaged with one another, thereby retaining the shoe part attached to the hoof. Guide means are provided to facilitate interengagement of the two flange portions.

3,712,383

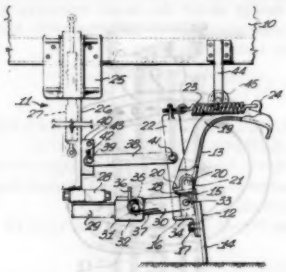
PLOW BLADE STRUCTURE

John W. Renahan, 163 Finch Ave. West, Willowdale, Ontario, Canada

Filed Oct. 21, 1970, Ser. No. 82,669
Int. Cl. A01b *61/00*
U.S. Cl. 172—264 5 Claims

The blade of a plow blade structure has a bottom section and a top section hingedly connected together. A linkage mechanism connects the bottom section with a supporting frame to permit rearward and upward movement of the bottom section if the force exerted on the front face thereof by an

obstacle is beyond a predetermined degree. The top section is spring-biased into operative position with respect to the bot-



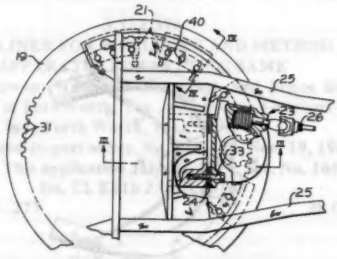
tom section but is foldable forwardly against the action of the spring in response to lifting movement of the blade.

3,712,384

ADJUSTABLE PINION FOR MOTOR GRADER CIRCLE DRIVE

William F. Fisher, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 5, 1970, Ser. No. 77,971
Int. Cl. E02f *3/76*
U.S. Cl. 172—796 **2 Claims**



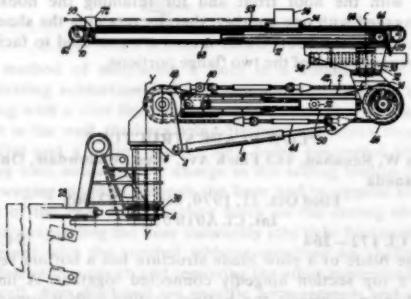
A drive pinion unit for a blade support circle which is readily adjustable relative to the blade circle gear to regulate the mating tolerance and minimize wear-caused backlash between the pinion and the circle gear.

3,712,385

MOBILE DRILLING RIG HAVING ADJUSTABLE BOOM

William Allen Hunt, Tynemouth, England, assignor to Envirotech Corporation, Salt Lake City, Utah

Filed Jan. 11, 1971, Ser. No. 105,260
Int. Cl. E21c *11/02*
U.S. Cl. 173—43 **19 Claims**



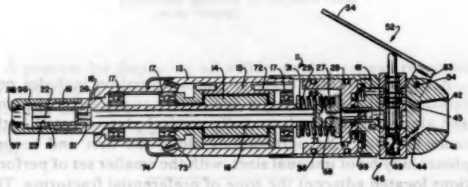
The drilling rig comprises a boom, one end of which is arranged to be pivotally attached to the vehicle while the other end supports a drilling-head carrier arm tiltably mounted thereon. The carrier arm is also rotatably mounted about an axis normal to the axis of tilting. The boom is arranged to be pivoted in a vertical plane by at least one hydraulic piston-and-cylinder unit attached to a vehicle and connected to the hydraulic system. The carrier arm is tiltable over an arc of 180° by an endless drive transmission extending from one end of the boom to the other. In one embodiment the transmission includes a drive wheel located at or close to one end of the boom. The drilling rig may be attached to a buck-digger vehicle having a hydraulic actuating system for providing the necessary hydraulic source.

3,712,386

PNEUMATIC HAND TOOL HAVING AUTOMATIC COLLET AND BRAKE

Rudolph W. Peters, 5786 Balmoral Drive, Oakland, Calif.

Filed March 1, 1971, Ser. No. 119,691
Int. Cl. A61c *1/05, 1/14*
U.S. Cl. 173—46 **11 Claims**



An improved pneumatic hand tool having an automatic collet and brake arrangement is described. The tool includes an air motor for rotatably driving a spindle on the end of which is located a collet for gripping the shank of a tool implement it is desired to rotate. A collet draw bar extends from the rear end of the collet axially through the spindle beyond the air motor and terminates in an enlarged portion which is adapted to be engaged by a piston. The piston is constrained for axial movement within a cylinder at the end of the air motor and, in response to the application of fluid pressure thereto, engages the collet draw bar and drives the collet outwardly from the spindle in order to open the same for reception of the shank of the tool. The tool includes a multi-port valve which selectively directs fluid either to the air motor for rotating the spindle or to the piston for opening the collet. A compression spring is also provided for urging the piston into frictional engagement with the end of the draw bar whenever air pressure is diverted from the motor, so that the piston acts as a brake to the rotation of the draw bar and, hence, to the rotation of the collet and its associated tool.

3,712,387

ROTARY PERCUSSION DRILLING MOTOR

Renic P. Vincent, and Lawrence B. Wilder, both of Tulsa, Okla., assignors to Amoco Production Co., Tulsa, Okla.

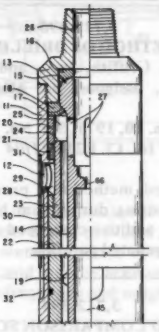
Continuation-in-part of Ser. No. 747,234, July 24, 1968, abandoned. This application Nov. 4, 1968, Ser. No. 784,499
Int. Cl. E21b *1/06*
U.S. Cl. 173—73 **4 Claims**

A liquid actuated percussion tool contains a case which surrounds the moving parts, an anvil mounted in the lower part of this case, a reciprocating hollow piston or hammer mounted above the anvil within the case and a valve system for applying pressure alternately to the two ends of the piston to reciprocate it in the case and cause it to strike the anvil. This in turn causes the anvil to apply axial reciprocating forces to a drill bit mounted on the lower portion of the anvil.

One or more ports are provided in the upper part of the case, permitting communication between the region outside of

the case and a part of the top of the hammer. As the piston reciprocates, the volume within the case adjacent to such port changes size and can, therefore, be called a variable volume. Liquid from outside the case moves through the port to occupy space in the variable volume in a cyclic manner with each reciprocation of the hammer.

The particular improvement of this invention comprises forming an axially oriented enclosed channel extending



downward from each port along the case, the port being otherwise blanked off, so that the cyclic movement of liquid into and out of the variable volume occurs through this downward oriented enclosed channel which extends a substantial distance below the port. This furnishes a disengaging space tending to prevent vertical motion of solids incorporated in the liquid outside the case up into the variable volume, which could otherwise jam the hammer and stop operation of the tool.

3,712,388

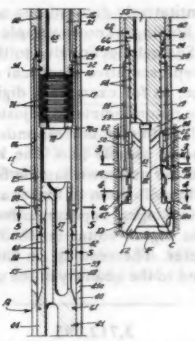
DOWN-HOLE AIR HAMMER

Alfred R. Curington, Houston, Tex., assignor to Baker Oil Tools, Inc., City of Commerce, Calif.

Filed Dec. 23, 1970, Ser. No. 100,848

Int. Cl. E21b *1/06*

U.S. Cl. 173—78 **17 Claims**



A down-hole air hammer embodying an outer housing structure connectible to a string of rotatable drill pipe through which compressed air is conducted. Upper and lower cylinder sleeves within the housing structure define an upper high pressure air annulus and a lower low or exhaust pressure annulus, the cylinder sleeves being longitudinally spaced from each other. A hammer piston reciprocates in the sleeves, having an enlarged intermediate portion slidable along the housing structure between the cylinder sleeves, there being small diameter upper and lower pistons slidable along the upper and lower cylinder sleeves, respectively, to provide a large intermediate piston area over which high pressure air can act to increase the impact force of the piston on a companion anvil secured to the drill bit rotatable by the housing structure. The high pressure air exhausts through the housing structure above the bit to provide sufficient air volume for carrying the cuttings upwardly through the annulus surrounding the drill pipe to the top of the hole being drilled.

3,712,389

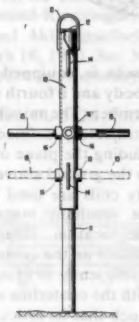
POST DRIVER

Benjamin G. Smoak, Route 2, Box 262, Saint Matthews, S.C.

Filed March 25, 1971, Ser. No. 127,941

Int. Cl. B25d *1/00*

U.S. Cl. 173—126 **6 Claims**



A tubular post driving member telescopes over the post and has an upper end plate to deliver impact to the top of the post. The driving member has sets of handle sockets at different elevations and these sockets receive removable handles in either 180° or 90° spacing circumferentially of the post to permit driving of the post in different situations by two workers or one worker. Additional hand grips are provided for erecting the post and driver and for transporting. An adjustable depth gage may also be included on the driver.

3,712,390

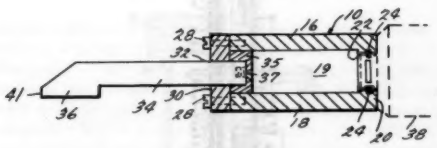
HIGH ENERGY IMPACT TOOL ASSEMBLY

Louis L. Berg, Denham Springs, La., assignor to Creative Tool Co., Denham Springs, La.

Filed Feb. 26, 1971, Ser. No. 119,092

Int. Cl. B25d *17/08*

U.S. Cl. 173—132 **4 Claims**

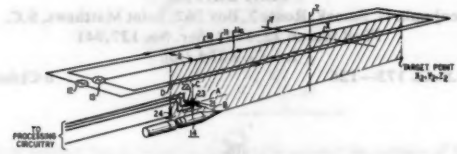


A high energy impact operated tool assembly is provided for powering interchangeable terminal devices, such as wedges, chisels, punches, cutters, mandrels, stamps and other shaping means. The assembly includes a heavy encasement and a member mounted for limited sliding movement as controlled by the encasement. The slidably mounted member has means at a first end for receiving exceptionally high impact forces and a second end having a wedge shape or chisel, cutter, mandrel, stamping, or other shaping means, as selected by the operator. Fastening means are provided for attaching a power hammer to the encasement and for holding the encasement and power source together during operation.

3,712,391
MOLE GUIDANCE SYSTEM

James Christopher Coyne, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Continuation of Ser. No. 792,893, Dec. 27, 1968. This application June 28, 1971, Ser. No. 157,570
Int. Cl. E21b 47/022, 47/024
U.S. Cl. 175—26 1 Claim



A subterranean missile is equipped with three mutually orthogonal coils in its body and a fourth suitably fixed in an articulatable steering member. The missile is guided along any desired underground trajectory defined with reference to a coordinate system including the plane of a dipole-quadrupole antenna system laid on the ground above. Voltages induced in the noncenterline body coils are used in a closed feedback loop to maintain the resultant magnetic field circularly polarized at the mole location. Heading errors are then revealed as a voltage phasor on the centerline coil. Rotation of the steering member sufficiently to bring the voltage induced in its coil into phase with the centerline coil voltage also aligns the steering member such that its articulation will reduce the heading error to zero. Any new trajectory may be defined as a suitable new voltage added to the centerline coil voltage.

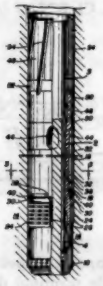
ERRATUM

For Class 175—269 see:
Patent No. 3,712,854

3,712,392
DIAMOND DRILL ASSEMBLY WITH BORE HOLE SUPPORT

Choiseul J. J. Dela Gorgendiere, North Bay, Ontario, Canada, assignor to Wheel Trueing Tool Co. of Canada, Ltd.

Filed Dec. 22, 1970, Ser. No. 100,759
Int. Cl. E21b 17/00
U.S. Cl. 175—325 10 Claims



A diamond drill string assembly which drills a much straighter hole than heretofor and in a small size has a sleeve adjacent the drill bit which is so close to the size of the reamed hole that it is substantially supported by it. Instead of allowing the cooling and material removal fluid return to be over the outside it is between the sleeve and another member, intermediate the sleeve and the core tube, which is a shell member convoluted to provide the passageways; and the sleeve rotates in a high shear paste in the micro-annulus between it and the bore hole.

To reduce whip still further a stabilizer sleeve is also provided above the sleeve in the string; the return flow for this stabilizer sleeve is in helical grooves along the surface. The ports allowing transfer of the flow from inside the sleeve to outside also function as wrench engagements to facilitate dismantling.

3,712,393
METHOD OF DRILLING

David B. Sheldahl, Griffith, Ind., and John H. Striegler, Richardson, Tex., assignors to Atlantic Richfield Co., New York, N.Y.

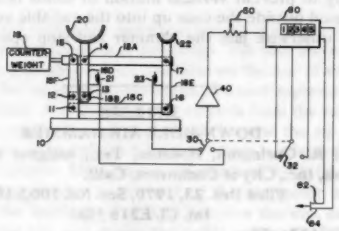
Filed Jan. 20, 1971, Ser. No. 108,170
Int. Cl. E21b 21/04
U.S. Cl. 175—65 9 Claims

A composition and method for preventing catastrophic vibration of a drill string during slim hole drilling wherein there is employed an additive composed of sulfurized lard oil, mineral oil, and halogenated paraffin.

3,712,394
LOAD COMPARISON SCALE

Jeffrey B. Davies, Amherst, and Benjamin F. Kendig, Nashua, both of N.H., assignors to Tridyne Corporation, South Merrimack, N.H.

Filed Aug. 15, 1969, Ser. No. 850,600
Int. Cl. G01g 19/00
U.S. Cl. 177—1 14 Claims



A scale for quantitatively determining an unknown sample includes a pan for holding a known sample and another for an unknown sample. Scale deflection due to the known sample is translated into a representative electrical signal and coupled to a display device, as for example a digital voltmeter by a potentiometer. The potentiometer is adjusted so that the reading on the digital voltmeter corresponds quantatively with samples in the known sample pan. The known samples are then removed, and the unknown sample is placed on its corresponding pan. The deflection of that scale is likewise translated to an electrical signal representative of the deflection and coupled to the digital voltmeter through the aforementioned potentiometer. The reading on the digital voltmeter will then correspond to the quantity of the unknown sample.

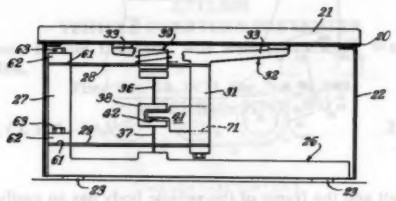
3,712,395
WEIGHT SENSING CELL

August L. Streater, and John A. Whitney, both of Bluffton, Ind., assignors to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Nov. 16, 1970, Ser. No. 89,736
Int. Cl. G01g 3/16
U.S. Cl. 177—210 27 Claims

This disclosure deals with a weight sensing cell for a scale, including two differentially loaded vibrating members. The two members are pretensioned, and they are arranged and connected to a weighting platform of the scale such that, by the differential loading, a weight on the platform increases the tension on one member and decreases the tension on the other

member, the amount of tension on each member determining its frequency of vibration. Means is provided to generate two signals which are respectively representative of the frequencies of vibration of the two members, and the frequency of one of these members or a combination of the frequencies of the



two members is taken as an indication of the amount of weight on the platform. Means is also provided to adjust the amount of pretension on the members and to compensate for any nonlinear characteristic, and thereby achieve an essentially linear relationship between frequency and weight.

3,712,396

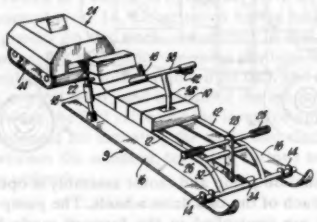
OVER-SNOW VEHICLE

Don S. Ende, 75 Wiehart Boulevard, Commack, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,402

Int. Cl. B62m *27/00*

U.S. Cl. 180—5 R **11 Claims**



The specification and drawings disclose a sled resiliently mounted on skis pushed by a self-contained, endless track propulsion unit which has 3° of pivotal freedom with respect to the sled.

3,712,397

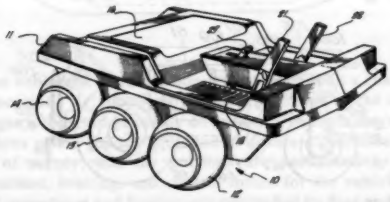
TOY VEHICLE

Jay Smith, III, Pacific Palisades; Gerald W. Schmidt, Woodland Hills, and Lawrence Temple Jones, Pacific Palisades, all of Calif., assignors to California R & D Center, Pacific Palisades, Calif.

Filed Aug. 9, 1971, Ser. No. 169,922

Int. Cl. B62d *11/06*

U.S. Cl. 180—6.2 **15 Claims**



A toy vehicle, simulating an all-terrain vehicle, is disclosed in which the vehicle body is supported on three pairs of coaxial wheels. The middle pair of wheels, which is the driving pair, is adapted to be individually braked to enable the vehicle to corner about the locked wheel. This wheel braking is accomplished by raising either side of the vehicle body with respect to the axle supporting the drive wheels to move the drive wheel out of engagement with a drive pinion and into locking engagement with a stationary gear sector mounted on the body. The relative positioning of the drive wheel axle with respect to the body is controlled by a pair of hand levers pivotally mounted on the housing and connected at their extremities to both ends of the drive wheel axle.

3,712,398

HYDRAULICALLY OPERABLE DEVICE FOR CHANGING THE TRACK WIDTH OF TRACK-LAYING VEHICLES

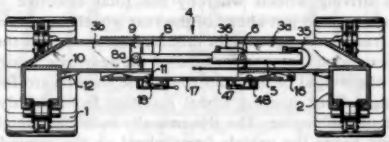
Ernst Althaus, Dortmund-Kirchhorde, Germany, assignor to Orenstein & Koppel Aktiengesellschaft, Berlin, Germany

Filed March 16, 1971, Ser. No. 124,867

Claims priority, application Germany, March 19, 1970, P 20 13 144.0

Int. Cl. B62d *55/00*

U.S. Cl. 180—9.48 **8 Claims**



A track laying vehicle in which the tracks at each side of the vehicle are supported on carriages, with the carriages having spars fixed thereto and extending toward the vehicle and slidably supportingly engaging the vehicle, fluid motors connected between opposed spars are reversibly energizable for moving the carriages between innermost and outermost positions on the vehicle. Wedge shaped abutment elements limit the movement of the spars transversely of the vehicle and a lock is provided for locking each spar in adjusted position.

3,712,399

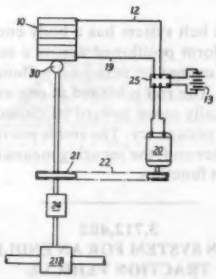
BATTERY POWER CONTROL DEVICE

William H. Ruffle, and Brian C. Hemsley, both of Hassocks, England, assignors to C. Dugard Limited, Hove, Sussex, England, by said Hemsley, a part interest

Filed July 13, 1970, Ser. No. 54,351

Int. Cl. B62d *51/04*

U.S. Cl. 180—19 R **2 Claims**



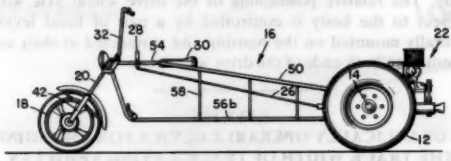
An electric power control means for a vehicle includes a stack of carbon plates in the power supply circuit of the vehicle and means for applying pressure to said plates in accordance with the torsional stress in the vehicle transmission, the electric power being proportional to the pressure applied to the carbon plates so that the power is controlled in accordance with the requirements of the vehicle.

3,712,400

THREE-WHEEL VEHICLE

Claude Earnest Barnes, 729 Inglewood Street, Salinas, Calif.

Filed March 15, 1971, Ser. No. 124,385
Int. Cl. B62d *61/08*
U.S. Cl. 180—27 **5 Claims**



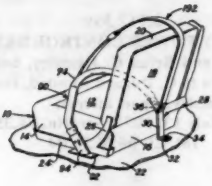
A three-wheeled motor vehicle adapted for a wide range of competitive and recreational motor sports activities. A multi-cylinder internal combustion engine having a large displacement relative to conventional three-wheeled vehicle engines is mounted on the rear axle with its center of weight acting behind the center of rotation of the two rear driving wheels. A statically balanced weight distribution is achieved with respect to the driving wheels whereby the total effective vehicle weight is applied just ahead of the rear wheels to obtain maximum traction. A lightweight tubular frame supports the rider at an extended distance forward of the rear axle in order to utilize the weight of the rider to oppose the upward force on the single front steering wheel resulting from the dynamic torque of the engine. The dynamically balanced weight distribution keeps the vehicle front wheel on the ground at all times and provides stability and maneuverability even during periods of maximum torque and acceleration.

3,712,401

SAFETY BELT SYSTEM FOR MOTOR VEHICLES

Barbara G. Rothschild, 2134 Springdale Road, Columbus, Ga.

Filed Jan. 20, 1971, Ser. No. 108,075
Int. Cl. B60r *21/10*
U.S. Cl. 180—82 **10 Claims**



A vehicular seat belt system has a body encircling, arcuate rod of semi-rigid form positioned across a seat in a position such that the seat cannot be occupied without first manually displacing the rod. The rod is hinged at one end and is biased so as to automatically move toward its closed position when released after seat occupancy. The rod is provided with securing means at its other end, the securing means including an automatic adjustment function.

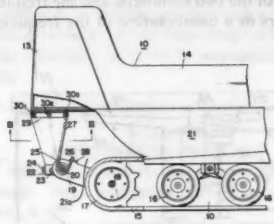
3,712,402

SUSPENSION SYSTEM FOR AN ENDLESS BELT TRACTION VEHICLE

Yasuo Masuda, and Magohei Tsukamoto, both of 3500 Shinpara, Hamakita-shi, Japan

Filed Aug. 26, 1970, Ser. No. 67,034
Claims priority, application Japan, Sept. 1, 1969, 44/82451
Int. Cl. B62d *55/30*
U.S. Cl. 180—5 R **5 Claims**

A suspension system for an endless belt traction vehicle and more particularly for a small size endless belt traction snow vehicle wherein the torsion spring fitted between the rear arms supporting the rear wheels about which there runs an endless track belt and the frame of the vehicle body has an easily adjustable spring force thereby freely to change the cushioning property and operating condition of the vehicle.

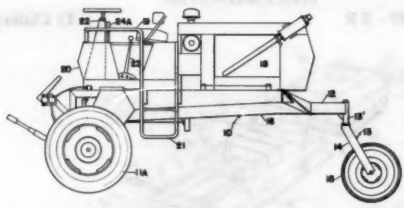


3,712,403

STEERING AND DRIVE ASSEMBLY FOR SELF-PROPELLED UNITS

Peter Pakosh, Winnipeg, Manitoba, Canada, assignor to Versatile Manufacturing Ltd., Winnipeg, Manitoba, Canada

Filed Feb. 8, 1971, Ser. No. 113,574
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.48 **22 Claims**



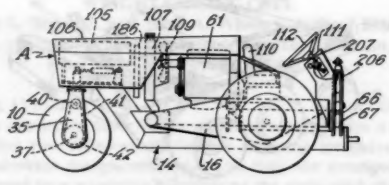
A combination pump and motor assembly is operative connected to each of the two drive wheels. The pump and motor assemblies are controlled in the forward mode by a single speed lever. A steering wheel operates a rack and pinion assembly having two racks each of which is operatively connected to one of the pump and motor assemblies so that turning the steering wheel speeds up one pump and motor assembly and hence one drive wheel and slows up the other pump and motor assembly and hence the other drive wheel. Means are provided to over-ride the steering mechanism so that one pump and motor assembly or the other can be reversed thus allowing very sharp turns.

3,712,404

HILLSIDE TRACTOR

Kermit H. Walquist, New Richmond, Wis., assignor to Shur Foot Tractor Company, New Richmond, Wis.

Filed Dec. 11, 1970, Ser. No. 97,128
Int. Cl. B60g *17/00*; B60k *3/00*
U.S. Cl. 180—41 **9 Claims**



A hillside tractor is provided capable of maintaining the engine and operator's platform level while the tractor travels

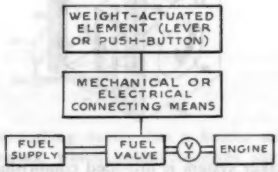
along the sides of hills, for mowing the hillsides or doing other work. The tractor is hydraulically driven by pumps powered by an internal combustion engine. The frame of the device comprises an elongated large diameter tubular member which functions as a chassis and also as a hydraulic fluid reservoir.

3,712,405

VEHICLE OVERTURN PREVENTER

Eugene Roland Dillmann, 408 Ballentine Street, Waveland, Miss.

Filed Dec. 10, 1971, Ser. No. 96,948
Int. Cl. B60r *21/02*
U.S. Cl. 180—104 **2 Claims**



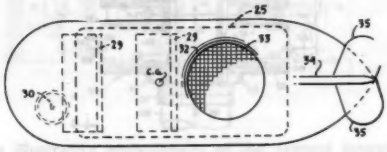
A device for preventing overturn of a tractor or other vehicle, having: a housing; within the housing an inclined weight-supporting track **10, 20** and an upright partition **9, 32**; a spherical weight (the ball **11** or **18**) movable on the inclined track; means to stop the vehicle-driving motor when the tractor is on a steep gradient and dangerously apt to overturn (the ignition-connected switch of FIGS. **1** to **3**, the fuel valve of FIGS. **4** to **6**); and a control lever **14, 22**, actuated by the ball when it is moved by gravity on the track, connected to the switch (or valve) for moving it into motor-stopping position. A weighted slide optionally may be substituted for the ball, and a push button for the control lever; and instead of the mechanical connection between the fuel valve and the lever (or optional push button) a solenoid for actuating the valve and electrical connections between the solenoid, lever (or button) and the battery may be utilized.

3,712,406

GROUND EFFECT VEHICLE

William R. Bertelsen, Rock Island, Ill., assignor to Bertelsen, Inc., Neponset, Ill.

Continuation of Ser. No. 633,357, April 21, 1967, abandoned, which is a continuation-in-part of Ser. No. 731,001, April 25, 1958, abandoned. This application July 31, 1969, Ser. No. 871,765
Int. Cl. B60v *1/02*
U.S. Cl. 180—122 **6 Claims**



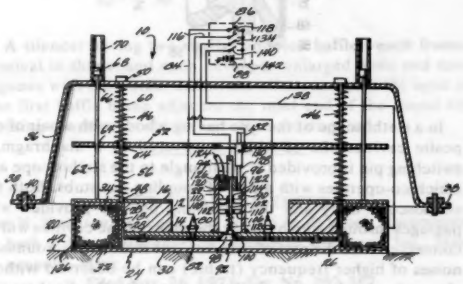
The vehicle of this invention is supported upon a cushion of gas, normally air, supplied by apparatus carried by the vehicle. The gas is directed generally downwardly beneath the vehicle. Portions of the gas are provided at different controllable angles of supply, and the portions are positioned to create propulsion, braking, and control forces for the vehicle. Forward propulsion and braking are controlled by fore and aft gas directing apparatus which vary the angle of fore and aft supply of pressurized gas beneath the vehicle. Roll forces are controlled by gas directing apparatus which vary the angle of lateral supply of pressurized gas beneath the vehicle. Yaw control forces are provided by apparatus differentially varying the lateral supply of portions of pressurized gas to create forces spaced from the center of lift or gravity or both of the vehicle. In addition, ports can be used to control pressurized gas flow beneath the vehicle to trim the vehicle for load variations, a predetermined trim, or other desired use. The vehicle also is adapted to operate upon new roadway structure that is grooved or shouldered to accommodate same.

3,712,407

SEISMIC PULSE GENERATING APPARATUS

Charles A. Tabor, 604 South Avenue D., Kermit, Tex.

Filed July 17, 1970, Ser. No. 55,935
Int. Cl. G01v *1/06*
U.S. Cl. 181—.5 EM **1 Claim**



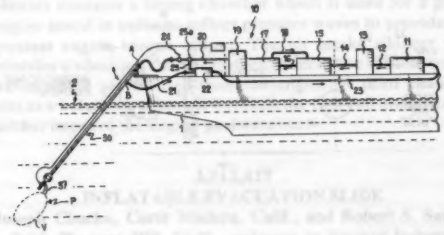
A seismic pulse generating apparatus having a combustion chamber formed by a piston and cylinder with energizable electromagnets which hold the piston and cylinder together to allow the compression chamber to be filled with a combustible gas mixture to a desired pressure prior to ignition and the generation of the seismic pulse.

3,712,408

METHOD OF AND APPARATUS FOR CREATING A SHOCK WAVE BENEATH THE SURFACE OF A BODY OF WATER

Raymond Muniz, 78 Versailles, France, assignor to Compagnie Generale De Geophysique, Paris, France

Filed July 31, 1970, Ser. No. 59,983
Claims priority, application France, Aug. 1, 1969, 6926481
Int. Cl. G01v *1/14*
U.S. Cl. 181—.5 H **11 Claims**



A shock wave is produced in a body of water for seismological study of the underlying ground by abruptly liberating at a desired depth in the interior of the body of water a quantity of steam under pressure so as to form a body of steam in the interior of the water. This body of steam, after its release, condenses violently as a result of its cooling and this violent condensation creates an implosion giving rise to a shock wave suitable for use in seismic prospecting.

3,712,409

STETHOSCOPE

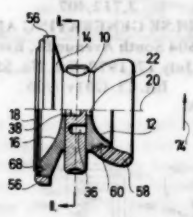
Iliasz Kizakisz, Budapest XVII, and Vilmos Horvath, Budapest XV, both of Hungary, assignors to Medicor Muvek, Budapest, Hungary

Filed Feb. 2, 1972, Ser. No. 222,798

Claims priority, application Hungary, Feb. 10, 1971, ME-1320

Int. Cl. A61b 7/02

U.S. Cl. 181—24 10 Claims



In a stethoscope of the type having a body with a pair of opposite cavities one of which is covered by a diaphragm, a switching pin is provided at right angle to the stethoscope axis which co-operates with a pair of coupling-out stubs. Both the stethoscope body and the switching pin are provided with passages through which one or the other of the cavities will be connected with the pair of coupling-out stubs. Thus, sounds or noises of higher frequency (treble) can be observed without absorption by deep sounds if the cavity with the diaphragm is placed on the observation surface since, then, deep sounds or noises of lower frequency are filtered out by the diaphragm. In the other position of the switching pin, the uncovered cavity of the body communicates with the pair of coupling-out stubs in which case sounds or noises of lower frequency (bass) can be observed. Obviously, in this case no filtering is necessary because deep sounds or noises absorb those of higher frequencies.

3,712,410

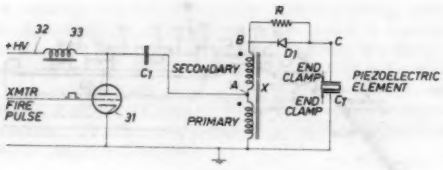
ACOUSTIC TRANSMITTING TRANSDUCER APPARATUS

Lee H. Gollwitzer, and Clovis L. LaFleur, both of Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,536

Int. Cl. G01v 1/14

U.S. Cl. 181—0.5 EM 10 Claims



An illustrative embodiment of the present invention includes acoustic transmitting transducer apparatus for use in well borehole logging which provides a sharper, more intense pulse of acoustic energy than heretofore possible while at the same time eliminating undesirable electric fields in the vicinity of the transducer element. Novel circuit means including remote mounted charge storage means, switching means, voltage transforming means and isolation circuitry together with mechanical end clamping are combined to produce this result.

3,712,411

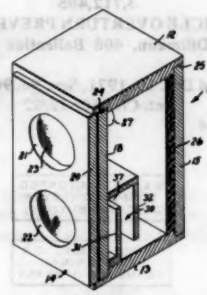
LOUD SPEAKER CABINET

Donald V. Monroe, 1629 N. Del Mar, Rosemead, Calif.

Filed March 17, 1972, Ser. No. 235,714

Int. Cl. G10k 13/00; H04r 1/28

U.S. Cl. 181—31 B 7 Claims



A loudspeaker system is provided comprising a vibration-free cabinet of minimum interior size having a relatively thick front wall including two spaced parallel sound exit apertures. A loudspeaker is attached to the rear of the front wall with its cone communicating directly with one of the exit apertures, and a sound-delay chamber of constant cross-section throughout its length is interposed between the second exit aperture and the interior of the cabinet, leading to the rear of the speaker cone. Sound waves from the two resulting sound paths reinforce each other in a slightly out-of-phase relationship which enhances the quality and depth of the resulting overall sound and utilizes the full power of the speaker. Also, microphone-speaker feedback is substantially eliminated at normal power and at locations beyond approximately one foot from the front of the cabinet.

3,712,412

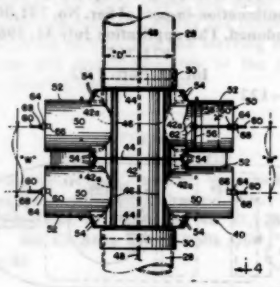
SOUND SUPPRESSING SYSTEM

James W. Hassett, Oak Park, and William M. Ihde, La Grange, both of Ill., assignors to Environeering, Inc., Skokie, Ill.

Filed Nov. 18, 1971, Ser. No. 199,879

Int. Cl. F01n 1/02, 1/16

U.S. Cl. 181—33 D 11 Claims

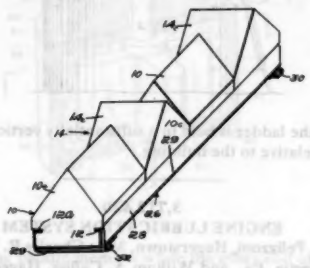


A system for suppressing sound in a high velocity fluid stream comprising conduit means extending downstream of the source of said sound, said conduit means having a cross-sectional flow area with a transverse dimension less than one half the wave length of the sound in said fluid, and a tunable, acoustic resonator having an inlet in communication with said conduit means downstream of said source and a closed, adjustable outer end, said resonator angularly intersecting the conduit means and reflecting sound waves received through the inlet back into said conduit means to attenuate succeeding sound waves therein.

3,712,413
SOUND ABSORBING DEVICE

Oliver C. Eckel, 155 Fawcett St., Cambridge, Mass.

Filed Dec. 15, 1971, Ser. No. 208,116
Int. Cl. E04b 1/86
U.S. Cl. 181—33 GE 7 Claims

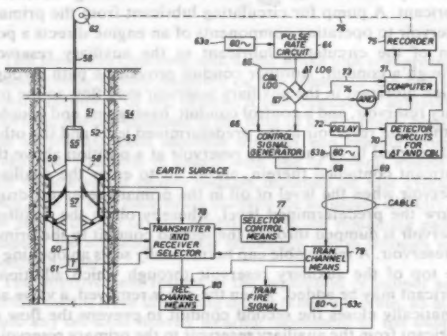


A sound absorbing device has a holder with oppositely disposed tongues, which holder receives sound absorbing members that have kerfs in opposite sides thereof into which said tongues enter. Said members have an inner straight portion or base at opposite sides, the outer parts of which are outwardly of said kerfs and extend laterally farther outward than the remainders of said members so that they contact each other to thereby close off the movement of sound waves through my device.

3,712,414
ACOUSTIC LOGGING APPARATUS FOR TRAVEL TIME AND CEMENT BOND LOGGING

Gerald J. B. Crawford, Norwalk, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed April 7, 1970, Ser. No. 26,266
Int. Cl. G01v 1/16, 1/14
U.S. Cl. 181—.5 FS 10 Claims

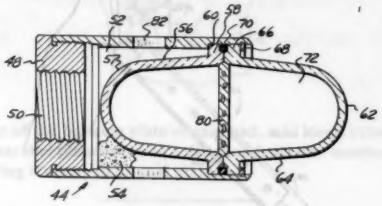


An illustrative embodiment of the present invention includes an acoustic well logging sonde having four articulated arm members disposed at quadrant intervals about a central tubular body member and having an acoustic transmitting transducer disposed on the lower portion of the body member. Two of the diametrically disposed arms carry a pair of acoustic receiving transducers displaced longitudinally from each other while the other two diametrically opposed arms each carry a single acoustic receiving transducer. A switching arrangement is provided for selecting groups of four of the six articulated transducers for making either cement bond log measurements or acoustic travel time measurements.

3,712,415
GAS EXHAUST SILENCER

Leland Feancis Blatt, and Frank H. Wiesenhofer, both of P.O. 24121 Mound Road, Warren, Mich.

Division of Ser. No. 81,051, Oct. 15, 1970, Pat. No. 3,672,465.
This application Nov. 1, 1971, Ser. No. 194,108
Int. Cl. F01n 1/10, 7/16
U.S. Cl. 181—60 1 Claim

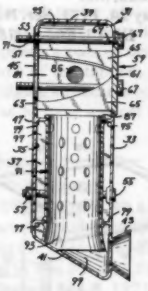


A silencer having two similar opposed baffles, each frustoconical in shape, and each having its enlarged open end contiguous with the similar end of the other, and with the apex of the first baffle being adjacent the inlet end of the sound absorbing chamber in which the baffles are disposed.

3,712,416
AIR INTAKE SILENCER

Ian N. Swanson, St. Paul, and Wayne M. Wagner, Rosemount, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Nov. 26, 1971, Ser. No. 202,357
Int. Cl. F01n 1/02, 1/06, 1/08
U.S. Cl. 181—35 A 4 Claims



An air intake silencer that can be quickly attached to the carburetor of a snowmobile's internal combustion engine. The silencer contains a tuning chamber which is sized for a given engine speed in order to reflect pressure waves to provide the greatest engine torque output. The air intake silencer also contains a silencing chamber which silences the audible sound waves which are emitted from the engine. A third chamber acts as a balancing chamber between the first two chambers to further improve the engine performance.

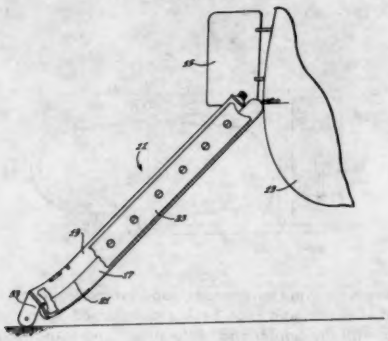
3,712,417
INFLATABLE EVACUATION SLIDE

Joseph Chacko, Corte Madera, Calif., and Robert S. Satterfield, Pleasant Hill, Calif., assignors to Sargent Industries, Inc., Los Angeles, Calif.

Filed April 5, 1971, Ser. No. 131,270
Int. Cl. A62b 1/20; B65g 11/10
U.S. Cl. 182—48 15 Claims

An inflatable slide, for use in emergency evacuation of aircraft, including upper and lower inflation tube assemblies which are suitably bound together. A taut, relatively frictionless material is positioned between the upper and lower assem-

blies to provide a slide surface which is both protected by and depressed below the upper tube assembly. Suitable airflow paths are provided in the assemblies for producing predetermined sequential inflation of each assembly to ensure that,



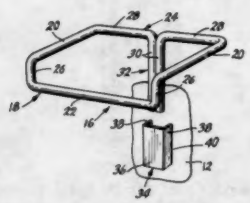
when the slide is inflated, it attains a position in which it may be properly used. The slide is held to the aircraft by a releasable stitch-locking means which allows the slide to serve as a raft when it is unlocked.

3,712,418

CLIMBING ASSEMBLY HAVING REMOVABLE STEPS

Wilburn C. Currence, Jr., Centralia, Mo., assignor to A. B. Chance Co., Centralia, Mo.

Filed May 24, 1971, Ser. No. 146,118
Int. Cl. E06c *1/38*
U.S. Cl. 182—92 4 Claims



A climbing assembly for transmission poles and the like includes a series of removable steps in the nature of open frames having downturned stems insertable into tubular brackets welded or otherwise rigidly affixed to the poles. The steps are provided with rungs of a size and disposition to permit their further use as working platforms or stages and are offset for safety purposes. The releasable attachment is such as to obviate lateral or other movement during use to preclude accident or injury.

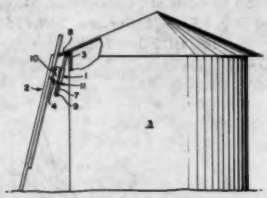
3,712,419

LADDER ATTACHMENT

Carl F. O'Hara, P.O. Box 1046, Fort Benton, Mont.

Filed Aug. 4, 1971, Ser. No. 168,903
Int. Cl. E06c *7/48, 5/36*
U.S. Cl. 182—107 7 Claims

A ladder attachment including a spring biased rod adapted to frictionally engage the bottom surface of a building eaves,



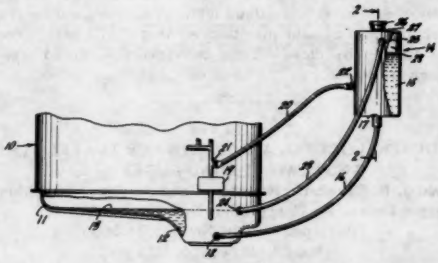
whereby the ladder is held in a substantially vertical, operative position relative to the building.

3,712,420

ENGINE LUBRICATION SYSTEM

Winton J. Pelizzoni, Hagerstown, Md.; Charles R. Baumbaugh, Greencastle, Pa., and William A. Calliss, Hagerstown, Md., assignors to Mack Trucks, Inc., Allentown, Pa.

Filed April 6, 1971, Ser. No. 131,711
Int. Cl. F01m *11/12*
U.S. Cl. 184—103 R 6 Claims



An engine lubrication system comprising a primary reservoir containing lubricant at a predetermined level and a hermetically sealed auxiliary reservoir containing additional lubricant. A pump for circulating lubricant from the primary reservoir to operating components of an engine directs a portion of the circulating lubricant to the auxiliary reservoir through a conduit. Another conduit provides a path through which lubricant in the auxiliary reservoir may flow to the primary reservoir, and a control conduit, having one end coupled to the main reservoir at the predetermined level and the other end coupled to the auxiliary reservoir at a position above the lubricant contained therein, allows air to enter the auxiliary reservoir when the level of oil in the primary reservoir drops below the predetermined level, whereby oil in the auxiliary reservoir is dumped through the second conduit to the primary reservoir. A removable cap hermetically seals an opening at the top of the auxiliary reservoir through which additional lubricant may be added. When the cap is removed, a valve automatically closes the second conduit to prevent the flow of lubricant from the auxiliary reservoir to the primary reservoir.

3,712,421

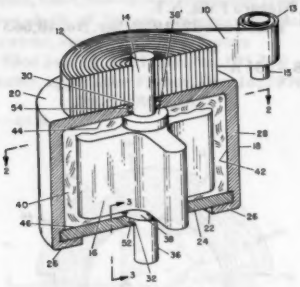
ROTARY TIMER

Harry J. Hadfield, Hunterdon County, N.J., assignor to the United States of America as represented by the Secretary of the Army

Filed June 15, 1971, Ser. No. 153,320
Int. Cl. F03g *1/00*
U.S. Cl. 185—37 1 Claim

This invention relates to a fluid controlled rotary timer capable of measuring elapsed times ranging from minutes to months and which is insensitive to gravitational forces. A rotary paddle member is operatively positioned within a circu-

mambient housing containing a viscous silicone gum retarding fluid. An external constant torque spiral spring is connected to



one end of the paddle member while the other end of this paddle member serves as an output shaft.

3,712,422

DISK BRAKE ASSEMBLY

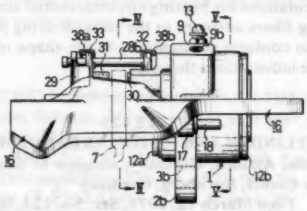
Tetsuo Haraikawa, Funabashi-shi, Chiba-ken; Sadao Kondo, Yokohama-shi, Kanagawa-ken, and Hiromi Yazawa, Tokyo, all of Japan, assignors to Tokico Ltd., Kawasaki-shi, Kanagawa-ken, Japan

Filed Nov. 8, 1971, Ser. No. 196,485

Claims priority, application Japan, Nov. 7, 1970, 45/98181

Int. Cl. F16d *55/22*

U.S. Cl. 188—72.3 **2 Claims**



This invention concerns with a disk brake unit comprising a cylinder body fixedly mounted on the chassis or the like stationary members of the vehicle, a pair opposedly actuatable hydraulic pistons mounted in the bore of said cylinder body, a pair of friction pads movable towards and remote from a brake disk rotatable in unison with one of several wheels of said vehicle and a caliper slidably mounted on said cylinder body, one of said pads being adapted for actuation directly by the action of one of said pistons, while the remaining pad is adapted for actuation by the remaining piston through said slidable caliper.

The improvement resides in the separation of caliper supporting means from the sliding means relative thereto, so as to avoid any off-axial heavily wearing movement of the caliper actuating piston relative to said cylinder body.

3,712,423

DISC BRAKE ANTI-RATTLE MEANS

Jean-Claude Girauldon, 77 Ponthierry, France, assignor to Societe Anonyme D.B.A.

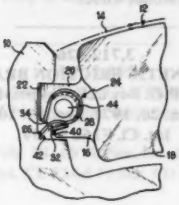
Filed May 4, 1971, Ser. No. 140,073

Claims priority, application France, May 5, 1970, 7016323

Int. Cl. F16d *65/00*

U.S. Cl. 188—73.5 **2 Claims**

In a disc brake antirattle means interposed between the coacting surfaces of a pad and a fixed support which consist of a wire spring carried by the pad and having one hair pin shaped projection extending toward the adjacent anchoring surface of the fixed support, said projection being continued at both ends by wire loops, the free ends of which anchor on



the edge of the backing plate of said pad, said loops extending in two parallel planes at such a distance from one another that said spring is clamped on said plate.

3,712,424

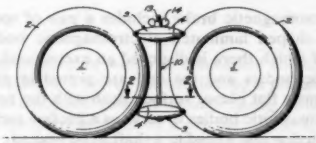
PARKING BRAKE

Alfred H. Swan, P.O. Box 566, Pearblossom, Calif.

Filed Jan. 15, 1971, Ser. No. 106,713

Int. Cl. F16d *49/00*

U.S. Cl. 188—74 **5 Claims**



A parking brake adapted to be placed between tandem wheels of a vehicle such as a camping trailer or a mobile home trailer. The brake comprises a pair of bridging structures extending between the tires of the tandem wheels and a screw shaft connecting the bridging structures to draw the structures toward each other so as to bear against the tires to prevent rotation.

3,712,425

AUTOMATIC ADJUSTER FOR A BRAKE CLEARANCE

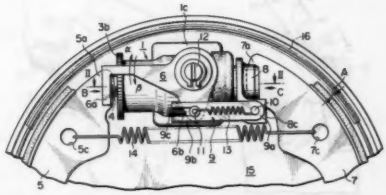
Tatsumi Torii, and Haruo Miyajima, both of Kariya, Japan, assignors to Aisin Seiki Co. Ltd., Aichi-ken, Japan

Continuation-in-part of Ser. No. 822,210, May 6, 1969, abandoned. This application Jan. 8, 1971, Ser. No. 105,078

Claims priority, application Japan, May 6, 1968, 43/30160

Int. Cl. F16d *65/56*

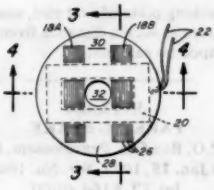
U.S. Cl. 188—79.5 GE **7 Claims**



The present invention is directed toward an automatic brake clearance adjusting means incorporating a connecting lever slidably connected with a ratchet wheel adjusting lever, said ratchet wheel adjusting lever being biased to rotate the ratchet wheel to adjust the brake clearance when the brakes are applied and said connecting lever acting to return the adjusting lever to a predetermined initial position when the brake shoes are returned to their non-apply position. The

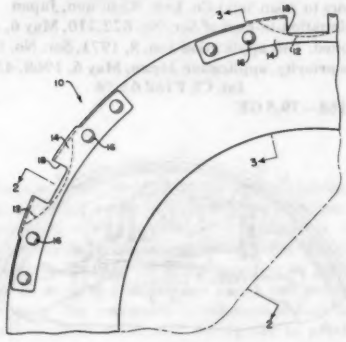
slidable connection enables the connecting lever to move relative to the adjusting lever when the brakes are applied and means are sufficient to prevent the adjusting lever from being biased to rotate the ratchet wheel.

3,712,426
MAGNETIC FRICTION BRAKE
Donald A. Gilbrech, P.O. Box 628, Fayetteville, Ark.
Filed Jan. 20, 1971, Ser. No. 108,066
Int. Cl. F16d 65/34
U.S. Cl. 188—164 4 Claims



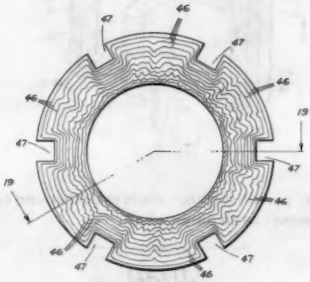
An electromagnetic brake includes a pair of spaced apart parallel E-shaped laminated electromagnetic bodies in the recesses of which there is disposed an exciter coil. The electromagnetic bodies and the coil are potted in plastic. The plastic forms a flat planar surface flush with the pole faces of the electromagnetic bodies to serve as a friction surface which brakes a friction disc keyed to a shaft to be braked.

3,712,427
GRAPHITE AND/OR CARBON DISK WITH REMOVABLE WEAR FACES
Albert W. Cook, Tallmadge, and Joseph F. Dernovshek, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 5, 1970, Ser. No. 87,126
Int. Cl. F16d 69/02
U.S. Cl. 188—251 A 9 Claims



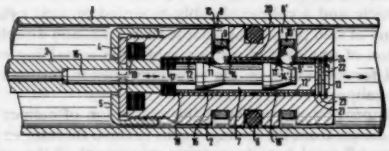
The invention comprises a brake disk assembly in the form of a carbon or graphite disk which is provided on both sides with thin wear plates of carbon or graphite material. The plates are either in segmented or full circle form and are secured to the core by rivets and bushings which also secure the keyway drives of the disks.

3,712,428
REINFORCED CARBON BODIES
Glenn R. Marin, Ransomville, N.Y., assignor to The Carborundum Co., Niagara Falls, N.Y.
Filed June 22, 1970, Ser. No. 48,063
Int. Cl. F16d 69/02
U.S. Cl. 188—251 A 30 Claims



The strength of circumferentially wound carbon-fiber reinforced carbon bodies is vastly improved if the reinforcing fibers are wound loosely, to a width greater than the axial thickness of the desired carbon body, and then axially compressed to cause radial overlapping of the carbon fibers. This technique is particularly useful for carbon bodies having an irregular perimeter, such as brake discs containing keyways or other indentations for bearing circumferential stress, since the reinforcing fibers adjacent to the stress-bearing perimeter can be made to conform substantially to the shape of the perimeter and the indentations therein.

3,712,429
CYLINDER AND PISTON ARRANGEMENT
Gunter Otto, Altbach, Germany, assignor to Suspa Federingstechnik GmbH, Nurnberg, Germany
Filed March 12, 1971, Ser. No. 123,767
Claims priority, application Germany, March 19, 1970, G 70 10 209.9
Int. Cl. F16f 9/34
U.S. Cl. 188—300 7 Claims



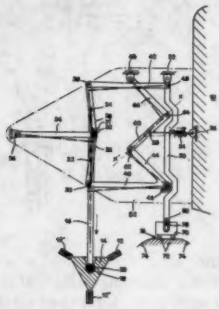
A piston and cylinder arrangement, more particularly for the stepless adjustment of table flaps, chair backs etc., comprises a cylinder containing a pressure medium, more particularly a gas under pressure. In the cylinder a piston rod with a piston fixed to it is arranged to slide. The piston is provided with an annular seal bearing against the cylinder bore and is bypassed by means of a connecting duct in the piston. The two outlet openings of the duct arranged on the two sides of the annular seal are completely closed by respective separate valves, which can be opened by means which is operated externally. The valve seats are formed in a sleeve of flexible material.

3,712,430

VEHICLE CURRENT COLLECTOR BALANCED SUPPORT

Pierre Charamel, Les-Cotes-de-Sassenage, and Hubert Ligones, Saint-Egreve, both of France, assignors to Merlin Gerin, Societe Anonyme, Rue Henri Tarze, France

Filed Jan. 11, 1971, Ser. No. 105,300
Claims priority, application France, Dec. 14, 1970, 7045086
Int. Cl. B60l 5/00
U.S. Cl. 191—45 R 14 Claims



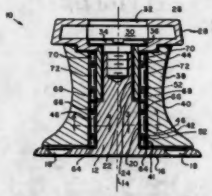
Current collecting device for a high speed vehicle comprising a collector head mechanically connected to the vehicle by an articulated system which permits relative displacement of the collector head with respect to the vehicle. The articulated system comprises a balancing device including a spring for counterbalancing vertical motion and a mass counterbalancing of lateral motion to maintain equilibrium regardless of the position of the collector head.

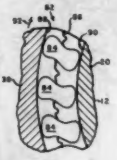
3,712,431

TORQUE DEVICE FOR WINCHES AND THE LIKE

Irving R. Versoy, Scituate, Mass., assignor to Walter J. Kreske, Newton Centre, Mass., a part interest

Division of Ser. No. 747,398, July 24, 1968, Pat. No. 3,581,854. This application Feb. 26, 1971, Ser. No. 119,201
Int. Cl. F16d 67/02, 41/07; B66d 1/30
U.S. Cl. 192—12 B 9 Claims





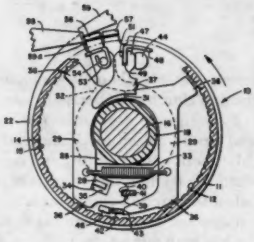
Positive backstop type silent infinitely variable reciprocating to unidirectional motion converter in the form of improved winch embodiments, each having a winch drum constrained to rotate in a single direction with respect to a winch spindle on which it is mounted, the constraint being achieved by a silent positive backstop action of a first roller, sprag or spring clutch engaging the drum and spindle, each winch also including a lever receiving winch top structure mounted to rotate on the spindle and constrained by silent positive backstop action of a second roller, sprag or spring clutch engaging the top structure and winch drum to rotate with respect to the winch drum only in the opposite direction of the winch drum rotation.

3,712,432

FRICTION CLUTCH

Egon S. Babler, Chicago, Ill., assignor to Teletype Corp., Skokie, Ill.

Filed Feb. 18, 1971, Ser. No. 116,374
Int. Cl. F16d 11/06, 13/14
U.S. Cl. 192—26 8 Claims



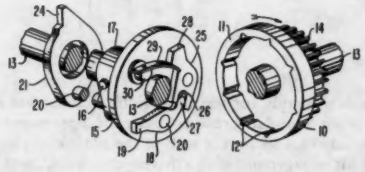
A friction clutch, in which a constantly rotating driving drum is coupled to a driven clutch disc by a plurality of friction shoes is equipped with an arcuate spring band which is coupled to the friction shoes by a pry bar. Upon actuation of the clutch, the drum is initially engaged by the spring band whereupon movement of the band pivots the pry bar to engage the friction shoes with the drum. Since the band spring is coupled to the friction shoes, the friction shoes move into engagement with the drum at a rate and force which is directly related to the speed of the drum. By relating the force with which the friction shoes engage the drum to the speed of the drum, the shoes are prevented from initially rebounding from the drum thereby substantially reducing undesirable slippage and vibrations in the clutch.

3,712,433

DUAL TORQUE COUPLING

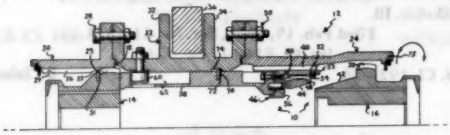
Paul John Thut, Penfield, N.Y., assignor to Burroughs Corp., Detroit, Mich.

Filed Oct. 7, 1970, Ser. No. 78,780
Int. Cl. F16d 11/00
U.S. Cl. 172—28 11 Claims



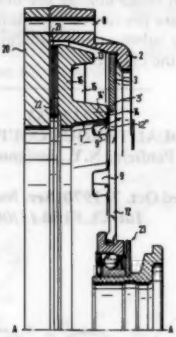
A torque coupling mechanism having a driving member engageable by engaging means that is pivotally connected to a driven member for rotation of the driven member in one normal direction. An engagement sustaining means maintains the engaging means in engagement with the driving member when the coupling mechanism is subjected to a torque tending to rotate the driven member in an opposite direction from normal rotation.

3,712,434
SYNCHRONIZING FLEXIBLE COUPLING
Norman J. Anderson, Fairview, and John L. Decker, Erie, both of Pa., assignors to Zurn Industries, Inc., Erie, Pa.
Filed Aug. 2, 1971, Ser. No. 168,268
Int. Cl. F16d 23/06, 3/18; F16h 55/12
U.S. Cl. 192—53 E 12 Claims



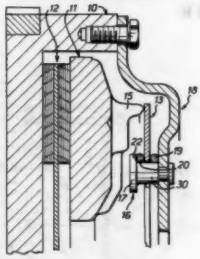
A synchronizing, flexible coupling includes a pair of conically shaped friction clutch members, one of which is made up of a plurality of contiguous segments. Each of the segments can pivot to and fro on crown teeth and can move back and forth in an axial direction. By pivoting and moving axially during rotation when the friction clutch members make contact, the segments allow the friction clutch members to contact one another without damage, even though the shafts to be coupled are out of alignment with one another.

3,712,435
CLUTCH ASSEMBLY
Helmut Kraus, Hofrat-Graetz-Strasse 18 1/3, 872 Schweinfurt am Main, Germany
Filed Aug. 16, 1971, Ser. No. 172,016
Claims priority, application Germany, Aug. 27, 1970, P 20 42 419.5
Int. Cl. F16d 13/50
U.S. Cl. 192—70.27 10 Claims



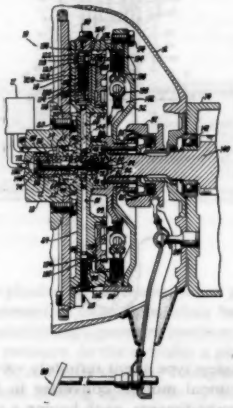
A clutch assembly for use in a friction clutch for a heavy truck has an annular pressure plate of approximately U-shaped axial cross section, a web of the plate carrying a contact face for engagement with a driven clutch disc, and two annular, radially spaced flanges extending in a rearward axial direction from the web. The radially inner flange has a greater axial height than the outer flange and engages a diaphragm spring whose outer circumference abuts against the clutch housing, while the radially slotted innermost portion may be engaged by a clutch release bearing. The pressure plate is suspended coaxially in the housing by means of leaf springs tangential relative to a circle about the clutch axis, and excessive axial stresses in the several springs are avoided by abutments on the housing engaging lugs on the pressure plate.

3,712,436
CLUTCH PLATE SPRING WITH PIVOT RINGS
Michel Theophile Rist, Boulogne, France, assignor to Societe Anonyme Francaise Du Ferodo, Paris, France
Filed Dec. 3, 1971, Ser. No. 204,624
Claims priority, application France, Dec. 11, 1970, 7044667
Int. Cl. F16d 13/36
U.S. Cl. 192—89 B 9 Claims



A clutch of the kind comprising a diaphragm acting between a cover and a clamping-plate and rockably mounted on said cover by means of a plurality of small pillars fixed on said cover, in co-operation with supporting means extending, at least in part, over two circumferences enclosing all said pillars, one of said supporting means being mounted between the diaphragm and the cover while the other supporting means is a keeper-ring mounted on the other side of said diaphragm, in which said keeper-ring comprises at least one flattened portion adapted to co-operate with the head of an associated pillar, said flattened portion being limited circumferentially by lateral stop flanks which lock said keeper-ring against rotation. The device is intended to prevent wear of the keeper-ring.

3,712,437
HYDRAULIC CLUTCH WITH CENTRIFUGAL AND MANUAL VALVES
Kenneth E. Snyder, Tovares, Fla., assignor to General Motors Corporation, Detroit, Mich.
Continuation of Ser. No. 762,543, Sept. 25, 1968, abandoned.
This application Sept. 28, 1970, Ser. No. 76,267
Int. Cl. F16d 43/284
U.S. Cl. 192—103 FA 10 Claims



A clutch for use with a throttle-controlled engine and a synchromesh transmission which includes a passage therethrough for the transmission of engine oil and uses the pressure thereof to move an annular piston for engaging, dis-

engaging and slippingly engaging clutch driving and driven discs, the oil returning to the engine sump after flowing across the discs, serving as a coolant therefor. The clutch includes three spring-loaded valves, the first of which controls the inlet and the exhaust of the engine oil in response to full depressions of the clutch pedal and further variably regulates the pressure supplied to the second of the three valves in response to partial depressions of the clutch pedal. The second valve regulates the pressure of the oil on the annular piston in response to centrifugal force resulting from engine speed and further in response to the variable pressure controlled by the first valve, resulting in a change in stall speed. The third valve variably controls the volume of the coolant flowing across the clutch discs in response to centrifugal force resulting from engine speed.

3,712,438

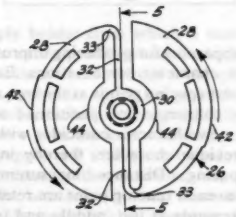
CENTRIFUGAL FRICTION CLUTCH

Joseph T. Roddy, Ballwin, and Wayne L. Page, St. Louis, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 858,753, Sept. 17, 1969, abandoned. This application March 15, 1971, Ser. No. 124,115

Int. Cl. F16d *43/18, 13/18*

U.S. Cl. 192—105 CD **12 Claims**



A centrifugal friction clutch having a cup-shaped driven member with a hub receiving a driven shaft and a generally cylindrical driving member freely entered therein for rotation in one direction and comprising two generally semicylindrical shoes, a central hub receiving a driving shaft and a pair of flexible arms extending oppositely outward from the hub between the adjacent flat surfaces of the shoes and connecting the opposite trailing ends of the shoes to the hub, whereby centrifugal force moves the shoes radially into frictional engagement with the annular wall of the cup and whereby the frictional force is increased as the arms flex when stressed between peripheral frictional force and driving torque, both driving and driven members being formed as castings of synthetic plastic material and the cup-shaped driven member having a flexible bottom wall and a long flexible hub which flex to compensate for slight non-parallelism and misalignment of the driving and driven shafts to which the device is connected.

3,712,439

ELECTROMAGNETICALLY OPERABLE FRICTION CLUTCH

Willi Schacher; Rudolf Schneider; and Rudolf Schneider, all of 7990 Friedrichshafen, Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

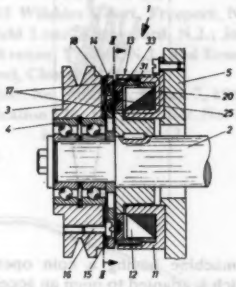
Filed Nov. 13, 1970, Ser. No. 89,278

Claims priority, application Germany, Dec. 23, 1969, P 19 64 311.9

Int. Cl. F16d *27/10*

U.S. Cl. 192—84 C **6 Claims**

A friction clutch is provided with clutch discs each of which is comprised of a plurality of rings of magnetic material magnetically isolated from each other so that flux follows a sinuous path back and forth between the discs via a plurality of pairs of pole faces. Accordingly, a plurality of areas of magnetic attraction between pole faces is afforded to effect strong engagement between discs, both of which are rotary, when a flux is provided by means of a stationary electromagnet. The arrangement minimizes flux leakage and provides for increased ability to transmit torque. The construction is simple



and compact, one such disc being manufactured by providing a composite of concentric magnetic and non-magnetic members which after being formed in an integrated assembly can have material removed to effect a plurality of pole faces. The other disc is effected by mounting spaced magnetic rings on a spring member which serves to maintain separation of the discs when the electromagnet is not energized.

3,712,440

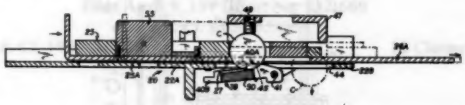
COIN SLIDE ASSEMBLY FOR RECEIVING A COIN STANDING ON EDGE

Harry Greenwald, Whitestone, N.Y., assignor to Greenwald Industries, Inc., Brooklyn, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,388

Int. Cl. G07f *5/14*

U.S. Cl. 194—55 **15 Claims**



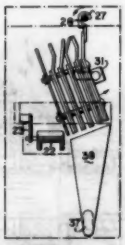
This disclosure is directed to a coin slide assembly for use in a coin operated machine having a coin slide provided with one or more coin slots, each arranged for accommodating a coin in a vertical or a standing on edge position in side by side relationship. Locking dogs are operatively associated with the slide to prohibit the advancement of the coin slide toward an inserted operative position unless a properly sized coin is disposed on edge in the appropriate coin slots. Cam actuators are associated with a coin track carried by the locking dog to render the coin assembly operative only when a coin of proper diameter and/or thickness is carried in the respective coin slot between the cam actuator and coin track. The assembly also includes provisions for effecting adjustment of a coin slot and/or actuating cam to accept coins of various sizes, or the blanking of a particular coin slot in order to inactivate it. The assembly further provides for blocking the coin opening through which the coin slot is inserted into the associated machine, to prohibit access to the coins after the slide has advanced past the coin opening toward an inserted operative position.

3,712,441

COIN RETURN MECHANISM FOR A VENDING MACHINE

Alfred H. Taylor, 10144 Sully Drive, Sun Valley, Calif.

Filed Feb. 23, 1971, Ser. No. 118,123
Int. Cl. G07f 3/02
U.S. Cl. 194—97 8 Claims



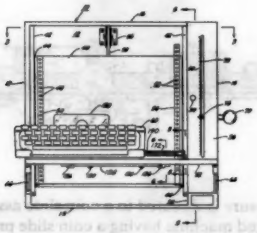
A vending machine having a coin operated dispensing mechanism which is adapted to open an access door upon the insertion of the correct combination of coins therein. A coin return mechanism is secured to the coin operated dispensing mechanism in a manner such that movement of the coin return lever will cause the entire dispensing mechanism to pivot about a vertical axis whereby a plurality of plates, which define coin passageways in the dispensing mechanism, are caused to separate and allow coins in the passageways to fall into a coin return chute. A selective guard is provided to ensure that if the access door is opened the coin return mechanism is rendered inoperative.

3,712,442

PEGBOARD TYPEWRITER

James K. Davies, 103 McFadden Place, Newport Beach, Calif.

Filed March 5, 1970, Ser. No. 16,641
Int. Cl. B41j 3/38
U.S. Cl. 197—2 6 Claims



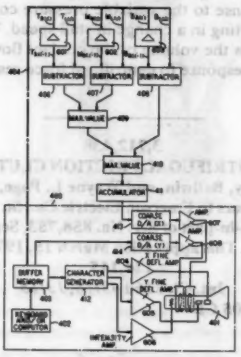
Apparatus is disclosed for typing entries onto a writing materials held in alignment on a pegboard. The apparatus is comprised of a frame adapted to support a carriage-less typewriter in a substantially horizontal position adjacent to a pegboard supported within the frame at an angle inclined from the vertical. The pegboard is movable upwardly and downwardly in the direction of inclination to provide line spacing, and a half-line spacing shift is provided to permit insertions between normal lines of typing. The typewriter is laterally movable with respect to the pegboard to provide letter spacing. Lateral shifting of the typewriter to selected positions is controlled by escapement and tabulator mechanism mounted on the typewriter support base so as to operatively engage the movable typewriter.

3,712,443

APPARATUS AND METHOD FOR SPACING OR KERNING TYPESET CHARACTERS

Max Vernon Mathews, New Providence, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 19, 1970, Ser. No. 65,056
Int. Cl. B41j 19/58
U.S. Cl. 197—84 A 4 Claims



Method and apparatus for producing improved print quality of alphanumeric character combinations. Each character is preassigned closest spacing points at the top, middle, and bottom. Successive characters are positioned so that one leftmost point of a new character coincides with one right-most point of the previous character, thereby insuring close intercharacter spacing. Distance measurements from the character body to each spacing point are retained in memory. The left measurements at top, middle and bottom of a new character to be positioned in the print line are subtracted from the right measurements of the top, middle and bottom, respectively, of the previous character in the print line using subtractor circuitry. Maximum value circuits are used to select the largest of the differences thus formed. The print line is displayed on an oscilloscope. The invention may also be practiced using a general purpose digital computer suitably programmed.

3,712,444

ARRANGEMENT OF KEYS OF KEYBOARD, ESPECIALLY FOR TYPEWRITER

I. Saint John Frost, 21, rue de la Comete, 75 Paris, France

Filed March 2, 1971, Ser. No. 120,239
Claims priority, application France, March 2, 1970, 7007390
Int. Cl. B41j 5/10
U.S. Cl. 197—100 4 Claims

New arrangement of keyboard keys especially for typewriters has at least 46 keys furnishing at least 92 places for characters, signs etc. These keys are distributed over four rows, framed by the typewriter control keys, arranged so that

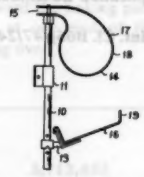
all of the keys together can be placed in an essentially rectangular framework of the keyboard deck, the space bar being provided in the lower portion of the keyboard in the conventional manner. This invention is particularly applicable to the keyboard of typewriters with Roman characters and makes it possible to type a text in several languages, such as for example, in French, German, English, Italian, Spanish, Portuguese, etc., without having to change typewriters.

3,712,445

SUPPLY MEANS FOR A CONTINUOUS PAPER STRIP IN PRINTING OFFICE MACHINES

Tord V. A. Lidstrom, Hedasvagen 24, Sandviken, Sweden

Filed May 6, 1970, Ser. No. 35,059
Int. Cl. B41j *15/04*
U.S. Cl. 197—133 R 3 Claims



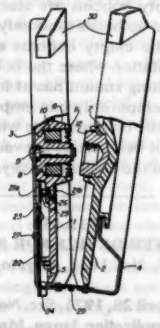
A paper supply holder from which a continuous strip of paper is fed to an office printing machine such as a typewriter or calculator and then returned from the machine to a collecting shelf. The paper holder which has generally the form of an open-ended cylinder includes a longitudinally extending slot from which paper e.g. in the form of a chain of blank forms is withdrawn the supply roll within the cylinder and fed to the machine. After leaving the machine, the chain of now-completed blanks, is returned to, and accumulates on, a shelf located beneath the paper holder. The paper holder and shelf are integrated into a common supporting structure which can be attached by brackets to the machine itself, or at the side of a table on which the machine is supported.

3,712,446

DEVICE TO CAST OFF WOUND RIBBON FROM A SPOOL

Hans-Georg Hengelhaupt, Nuernberg 8500, and Friedrich Teichmann, Feucht 8501, both of Germany, assignors to Triumph Werke Nuernberg, A.G., Nuernberg, Germany

Filed Nov. 9, 1970, Ser. No. 87,955
Claims priority, application Germany, Jan. 16, 1970, P 20 01 867.1
Int. Cl. B65h *75/14*; B41j *35/28*
U.S. Cl. 197—175 7 Claims



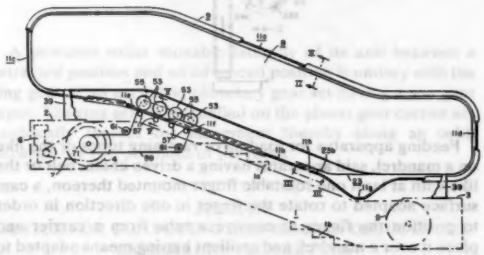
A ribbon spool has two spool disk components of which one disk component has a tapered hub element declining toward the other component. In order to cast off wound ribbon from the spool, its disk components are first separated and thereafter a device on said one disk is operated to push the ribbon away from the thick end of the hub. A spool handling device is provided for effecting such segmental operations efficiently.

3,712,447

HANDRAIL GUIDE SYSTEM FOR PASSENGER CONVEYOR

Henry Boltrek, 15 Wilshire Court, Freeport, N.Y.; Menno E. Hill, 17 Highfield Lane, Rutherford, N.J.; Joseph K. Kraft, 223 Pompton Avenue, Verona, N.J., and Ernest J. Schirmer, 67 Everett Street, Closter, N.J.

Continuation of Ser. No. 805,135, March 7, 1969, abandoned.
This application Feb. 17, 1971, Ser. No. 116,264
Int. Cl. B66b *9/12*
U.S. Cl. 198—16 9 Claims



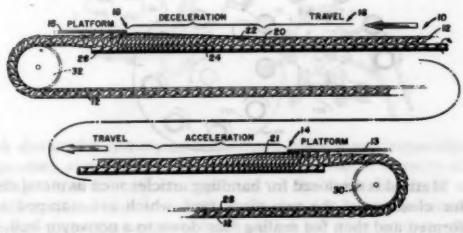
A stationary substantially continuous guide forming a closed guide loop eliminates the need for tensioning a passenger conveyor handrail and permits it to be pushed as well as pulled around the guide loop. A flexible portion of the guide may be bowed to adjust the length of the guide loop to the exact length of the handrail.

3,712,448

VARIABLE SPEED SIDEWALK

Richard D. Burson, Highland, and William H. Avery, Silver Spring, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed April 9, 1971, Ser. No. 132,689
Int. Cl. B65g *65/06*
U.S. Cl. 198—16 MS 12 Claims



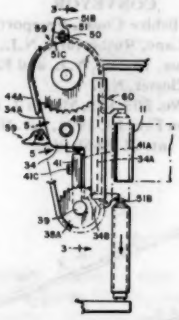
The invention relates to a moving sidewalk or article conveyor comprising a continuous belt capable of differential speeds along a portion of the surface of the belt. Discrete arcuate units forming the continuous belt tilt relative to the plane of the belt and mutually overlap in interdigitating fashion over a variable portion of the surface areas of the units to provide a level surface, the end portions of which surface travel at a constant first rate of speed while the intermediate portions therebetween accelerate to and decelerate from a second, more rapid constant rate of speed.

3,712,449

FEEDING APPARATUS

Joseph T. Holovnia, and Vitie S. Rakauskas, both of Shrewsbury, Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed April 21, 1971, Ser. No. 135,844
Int. Cl. B65g 47/00, 19/00
U.S. Cl. 198—20 R 5 Claims



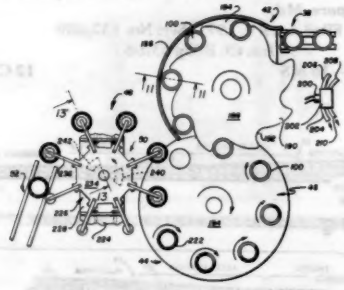
Feeding apparatus for loading or ramming tubes or the like on a mandrel, said apparatus having a driven chain, belt or the like with at least one rotatable finger mounted thereon, a cam surface adapted to rotate the finger in one direction in order to position the finger to remove a tube from a carrier and place it over a mandrel, and resilient biasing means adapted to cause said finger to rotate in another direction in order to fall away from the tube after it has been placed upon the mandrel.

3,712,450

METHOD FOR HANDLING ARTICLES

Robert L. Hurst, Muncie, Ind., assignor to Ball Corp., Muncie, Ind.

Division of Ser. No. 784,845, Dec. 18, 1968, Pat. No. 3,641,959. This application Dec. 18, 1970, Ser. No. 99,485
Int. Cl. B65g 47/04
U.S. Cl. 198—25 2 Claims



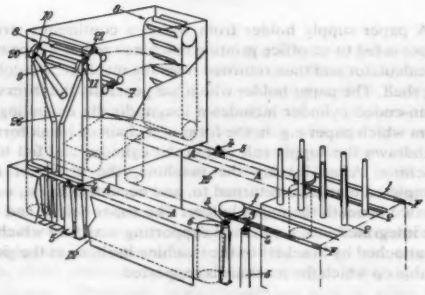
Method is disclosed for handling articles such as metal discs for closures of the two-piece type which are stamped and formed and then fed sealing face down to a conveyor belt. At first transfer zone, each disc or lid is pulled up against lower pass of second conveyor belt by a magnet. The lids are retained in contact with the belt by a magnetic pulley to swing up through arc to upper pass of belt. Lids are then conveyed to treating zone where gasket material is applied as lids are rotated and transported arcuately. The lids are picked up sequentially by magnetism or vacuum from coating table by radial arms on a carousel and transferred to upper pass of a next conveyor. At next transfer zone, lids are picked up sequentially by individual magnets on lower pass of next conveyor and moved to next transfer zone where they are released in groups to form transverse rows on wide conveyor belt. Lids are conveyed through curing station on to wide conveyor belt and realigned from transverse rows to fore and aft single file by a diverter. The lids are then transferred and fed sequentially to assembly zone by a next conveyor. Closure bands are also fed sequentially to assembly zone and combined with lids to produce assembled two-piece closures. Lids may alternatively be fed to different assembly zone where they are packed in sets for shipping. One-piece closures with integral lid and flange may be formed and processed in same manner.

3,712,451

EMPTY BOBBIN SUPPLY DEVICES FOR A BOBBIN CHANGER FOR SPINDLE TYPE SPINNING MACHINES

Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano S.A., Geneva, Switzerland

Filed March 9, 1971, Ser. No. 122,475
Claims priority, application Luxembourg, March 16, 1970, 60529
Int. Cl. B65g 47/24
U.S. Cl. 198—33 AD 11 Claims



An endless conveyor is arranged along each spindle bank and bears gripping hooks spaced regularly at intervals corresponding to those between the spindles. Each of the hooks can cooperate with a take-up head provided at the upper end of each bobbin. A loading station is arranged to present the take-up head of an empty bobbin to each gripping hook passing it. The empty bobbins are stacked horizontally in a reserve with the take-up heads randomly directed. A distributing device brings the empty bobbins successively from the reserve to a tilting station where the bobbins are represented horizontally. The tilting station has at its two ends, two steps arranged to retain temporarily one empty bobbin by its take-up head, so that all the bobbins leave with their take-up heads upwards. A conveyor belt carries the vertical bobbins towards the loading station of the endless conveyor.

3,712,452

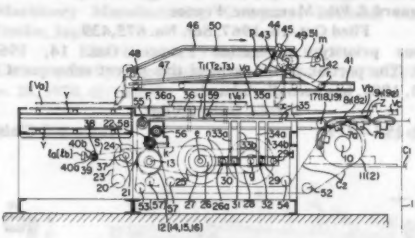
PAN TRANSFER DEVICE FOR BAKING OVEN

Katsushi Takahashi, No. 1021, Miyato, Asaka-shi, Saitama-ken, Japan

Filed April 28, 1971, Ser. No. 138,212
Claims priority, application Japan, May 8, 1970, 45/38685
Int. Cl. B65g 47/26
U.S. Cl. 198—34 3 Claims

A pan transfer device for baking oven operable to make a spacing between two successive baking pans being transferred

on a transfer member larger than that between two successive baking pans just taken out of the baking oven by lifting upward and shifting forward the baking pan to a stationary platform of higher level at one end of the transfer conveyor remote from the baking oven.

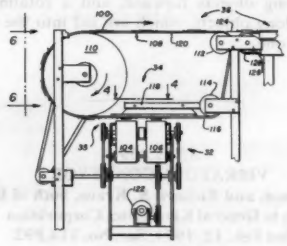


3,712,453

APPARATUS FOR TRANSFERRING ARTICLES

Robert L. Hurst, Muncie, Ind., assignor to Ball Corp., Muncie, Ind.

Division of Ser. No. 784,845, Dec. 18, 1968, Pat. No. 3,641,959. This application Dec. 18, 1970, Ser. No. 99,405
Int. Cl. B65g *17/46*
U.S. Cl. 198—41 7 Claims



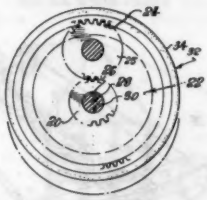
Completely automatic system is disclosed for handling articles such as metal discs for closures of the two-piece type which are stamped and formed and then fed sealing face down to a conveyor belt. At first transfer zone, magnet pulls each disc or lid up against lower pass of second conveyor belt. Magnetic pulley retains lids in contact with belt to swing up through arc to upper pass of belt. Lids are then conveyed to treating zone where gasket material is applied as lids are rotated and transported arcuately. Radial arms on carousel travel in circle to pick up lids sequentially by magnetism or vacuum from coating table and transfer them to upper pass of next conveyor. At next transfer zone, lids are picked up sequentially by individual magnets on lower pass of next conveyor and moved to next transfer zone where they are released in groups to form transverse rows on wide conveyor belt. Belt passes through curing station and diverter realigns transverse rows to fore and aft single file. Next conveyor transfers and feeds lids sequentially to assembly zone. Closure bands are also fed sequentially to assembly zone and combined with lids to produce assembled two-piece closures. Lids may alternatively be fed to different assembly zone where they are packed in sets for shipping. One-piece closures with integral lid and flange may be formed and processed in same manner.

3,712,454

POWERED ROLLER MECHANISM

James E. McKee, Goleta, Calif., assignor to Republic National Bank of Dallas; Irving Trust Company and Union Bank

Continuation of Ser. No. 865,071, Oct. 9, 1969, abandoned. This application Feb. 19, 1971, Ser. No. 117,125
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 R 23 Claims



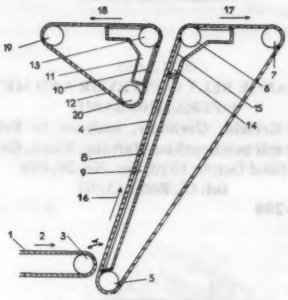
A powered roller movable laterally of its axis between a retracted position and an advanced position is unitary with the ring gear of an eccentric planetary gear set having a sun gear input. The ring gear is journalled on the planet gear carrier eccentrically thereof for movement thereby along an orbit between the two positions of the roller.

3,712,455

DEVICE FOR CONVEYING ROD-SHAPED OBJECTS AND ESPECIALLY CIGARETTES

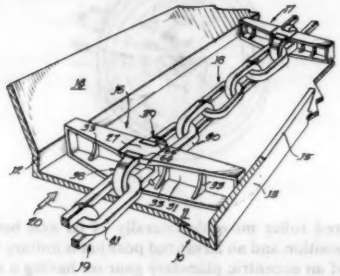
Henri Anfossi, Orleans, and Raymond Poupin, Fleury-les-Aubrais, both of France, assignors to Service D'Exploitation Industrielle des Tabacs at des Allumettes, Paris, France

Filed Dec. 22, 1970, Ser. No. 100,693
Claims priority, application France, Dec. 24, 1969, 6944949
Int. Cl. B65g *15/14*
U.S. Cl. 198—165 10 Claims



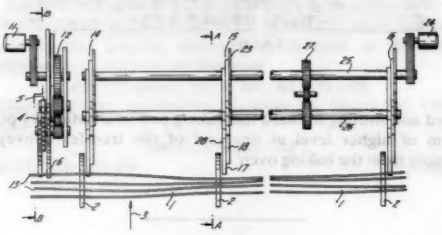
A device for conveying rod-shaped objects and especially cigarettes, comprising a first endless-belt conveyor element so arranged that the objects deposited on the external face of a predetermined portion of the said element are maintained thereon under the action of forces which are directed towards the interior of the said element, at least one second endless-belt conveyor element having one section substantially parallel to one section of said first element and moving in the same direction as said predetermined section, the distance between the said two sections being substantially equal to the thickness of said objects, means for applying to the objects located between said two sections forces directed towards the interior of said second element and means for varying the intensity of the forces which are directed towards the interior of at least one of said elements in order to initiate the transfer of objects from one element to the other.

3,712,456
CHAIN LINK FIXTURE
Frederick L. Kincaid, Portland, Oreg., assignor to Esco Corp., Portland, Oreg.
Continuation-in-part of Ser. No. 840,680, July 10, 1969, abandoned. This application May 14, 1971, Ser. No. 143,303
Int. Cl. B65g 19/08
U.S. Cl. 198—175 14 Claims



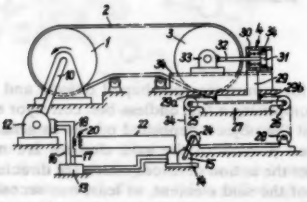
A fixture for connecting into a chain link includes a partial chain link cast integrally with the body of the fixture to form a solid unitary part. The partial chain link of the fixture has forwardly and rearwardly extending loops which are spaced to define a socket for receiving solid links of the adjacent connecting chain sections. A cap member is received in the socket to complete the partial link. The cap is welded to the partial link at front and back positions, and it is welded to the body of the fixture at transverse side locations. The invention eliminates the need for weld links in the connecting chain sections or mechanical fasteners in the fixture for holding adjacent chain sections, while providing a stronger fixture.

3,712,458
AUTOMATIC DISTRIBUTOR OF LONG OBJECTS SUCH AS BARS OR SIMILAR ITEMS
Hubert Elineau, Versailles, France, assignor to Etablissements R. Senard & Fils, Maromme, France
Filed Oct. 16, 1967, Ser. No. 675,439
Claims priority, application France, Oct. 14, 1966, 667159. The portion of the term of this patent subsequent to Dec. 23, 1987, has been disclaimed.
Int. Cl. B65g 25/04
U.S. Cl. 198—219 3 Claims



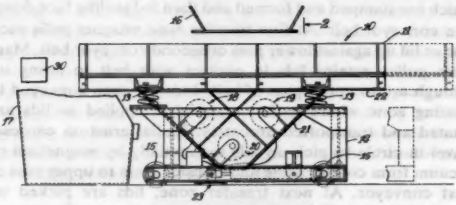
A distributor device for substantially long objects such as bars of steel or of metal has a first forwarding device consisting of a plurality of motor-driven rack plates performing a step-by-step advancing motion for first moving one end of one of the long objects forward, a second forwarding device consisting of several groups, each one of which has a plurality of motor-driven rack plates performing a step-by-step advancing motion similar to that of the rack bars of the first device, for moving the long objects forward, and a rotating arm for removing the long objects, which are fed into the distributor device, one by one.

3,712,457
LONG-DISTANCE BELT CONVEYOR AND METHOD OF OPERATING SAME
Hans Pelzer, Krefeld, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Oct. 6, 1970, Ser. No. 78,473
Int. Cl. B65g 15/30
U.S. Cl. 198—208 3 Claims



A long-distance conveyor with supporting means spaced relatively far from each other in the longitudinal direction of the conveyor, in which the tension of the belt means of the conveyor is automatically varied in conformity with the loading condition of the belt means in such a way that the preload on the belt is increased in conformity with a decrease in the load carried by the belt.

3,712,459
VIBRATORY CONVEYOR
Albert Musschoot, and Richard B. Kraus, both of Barrington, Ill., assignors to General Kinematics Corporation
Filed Feb. 12, 1971, Ser. No. 114,892
Int. Cl. B65g 27/00
U.S. Cl. 198—220 A 13 Claims



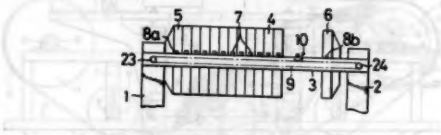
A vibratory conveyor arranged for conveying material in one or more directions and arranged for selective throwing of the material as for cooling the same prior to the conveying operation. The means for vibrating the conveyor is arranged to utilize different portions thereof jointly in different combinations to effect the selective conveying and throwing operations.

3,712,460

MECHANISM FOR AUTOMATICALLY TRANSPORTING FILTER PLATES IN FILTER PRESS

Susumu Kitajima, Higashi-Osaka, Japan, assignor to Kurita Machinery Manufacturing Company, Limited, Nishiku, Osaka, Japan

Filed Dec. 16, 1970, Ser. No. 98,758
Claims priority, application Japan, Feb. 7, 1970, 45/10886; Nov. 28, 1970, 45/105098
Int. Cl. B65g 25/08
U.S. Cl. 198—221 11 Claims



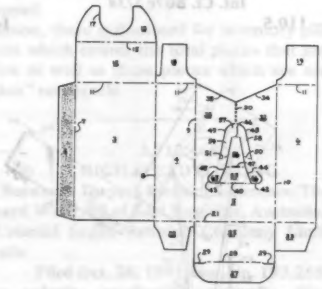
A transport assembly is mounted on a drive belt for reciprocal movement. When travelling in one direction, the transport assembly transports filter plates toward a movable end plate one after another. The transport assembly includes a drive dog for moving the filter plates in contact therewith and a stop dog for switching the running direction of the drive belt from a counter-transport direction to a transport direction upon contact with the filter plate. The drive dog is usually retained in an upright position while the stop dog is held in an inclined position. The drive dog, when inclined, brings the stop dog to the upright position so that the transport assembly can be moved back and forth for transport of the plates without being interfered with by the plates pressed together for filtration or by a plate which has already been transported.

3,712,461

SHADOW BOX FOR TUBE

Joseph F. Schillinger, Palos Hills, Ill., assignor to U.S. Plywood-Champion Papers, Inc.

Filed Dec. 17, 1971, Ser. No. 209,269
Int. Cl. B65d 5/50
U.S. Cl. 206—45.19 3 Claims



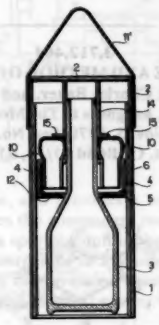
A one piece shadow box adapted for retaining a tube is disclosed having a unique cradle and suspension system formed out of the front shadow panels which takes advantage of the resilient properties of the packaging material (preferably paperboard) to retain the tube in position while providing front loading, economy of material, and keeping part of one side of the tube in approximately the same plane as the shadow box front panel, thereby enhancing stackability and related storage and handling properties of the box.

3,712,462

ORNAMENTAL PACKAGING CONTAINER FOR BOTTLES AND DRINKING GLASSES

Zoltan Gabor, Budapest; Jozsef Szanto, Arpad, and Gyorgy Martini, Budapest, all of Hungary, assignors to Papiripari Vallslat, Budapest, Hungary

Filed Feb. 2, 1971, Ser. No. 111,826
Claims priority, application Hungary, Feb. 2, 1970, PA-1051
Int. Cl. B65d 79/00
U.S. Cl. 206—47 R 3 Claims



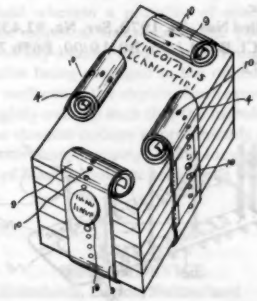
A packaging arrangement for supporting a plurality of glasses in a position around the neck of a bottle carried within a container. The carrier for the glasses includes an upper cup-shaped portion inverted to meet with an associated lower disc-shaped portion. Both portions have a central opening, so that the carrier can be slipped on and off the neck of the bottle. The cup-shaped portion has a plurality of openings which releasably support the glasses with a portion of the bottoms of glasses projecting above the carrier. A sleeve, which is designed to slip over the part of the neck of the bottle, laying above the glasses, is positioned between the lid of the container and the glasses. This sleeve has a plurality of flanges at its lower end which urge the glasses into the carrier and the carrier to a tight fit position on the bottle when the lid is closed on the container.

3,712,463

INDEXED PACKAGING AND STACKING DEVICES

Ute W. Bestehorn, 3330 Morrison Ave., Cincinnati, Ohio

Filed May 15, 1970, Ser. No. 37,786
Int. Cl. B65d 71/00
U.S. Cl. 206—65 R 7 Claims



My invention teaches the use of self spiraling bands preferably of transparent materials adapted to be flexible and used as binding means around a stack of materials. The bands are secured to a base plate and arranged to have movable identification tags attached to the bands which have spaced perforations throughout their length and provide means for

securing the bands each to the other. These tags are positioned in specific places along the bands to identify the stop or start of different items at different heights within a stack. The aforesaid base plate has removable casters readily attachable to it when it is desired to carry stacks of materials in greater quantities that cannot be carried about by hand. In addition my stacking device is used as a display rack for items, books or pamphlets and a sample is supported in open or closed condition for easy examination of an item, book or pamphlet contained in the stack, and other contents of the stack may be removed from the stack while an item, book or pamphlet is on display.

3,712,464

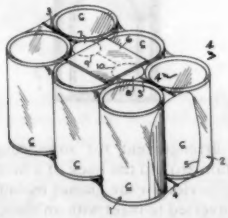
PACKAGE AND METHOD OF FORMING

James R. Chapman; Charles Baker, and Hermond G. Gentry, all of Atlanta, Ga., assignors to The Mead Corporation

Filed Nov. 3, 1970, Ser. No. 49,270

Int. Cl. B65d *65/16, 85/62*

U.S. Cl. 206—65 S **7 Claims**



An article package comprises a pair of complementary cavity defining half sections constituting opposite portions of an article enveloping structure, and a pair of seams forming oppositely disposed junctions between a pair of opposite edges of one half section and the corresponding edges of the other half section. The package half sections are formed of heat shrinkable sheet material which is stretched initially to form the cavities and the heating pattern and stretching operation are such that the corners of the resulting cavity defining half sections are not stretched to an unduly thin condition. After the package is formed heat is applied in a predetermined manner so as to shrink the half sections into conformity with the packaged items and so as to control the thickness of certain areas of both half sections.

3,712,465

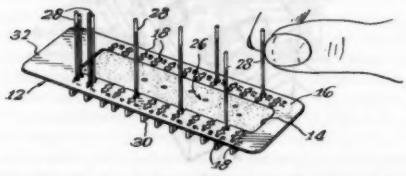
TRAY FOR USE IN SEALING CAPILLARY TUBES

Fritz Deuschle, St. Louis, Mo., assignor to Sherwood Medical Industries Inc.

Filed Nov. 24, 1970, Ser. No. 92,432

Int. Cl. B65d *1/36;* **B01l** *9/00;* **B65b** *7/16*

U.S. Cl. 206—72 **7 Claims**



An integral sealant containing tray and capillary tube classification and holding system for use in sealing the ends of a plurality of capillary tubes. The capillary tube holding system also forms lateral support for the tray to inhibit tipping of the tray during use and the tray is provided with a convenient handle tab.

3,712,466

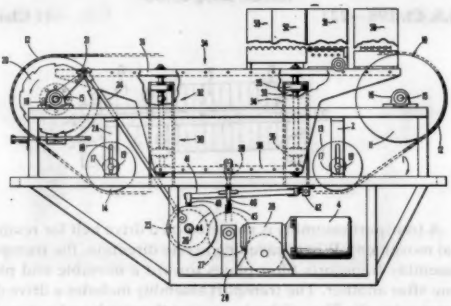
INSPECTION AND TRANSFER MECHANISM

Yvon C. Aubry, Quebec, and Jacques Vallance, Montreal, both of Canada, assignors to Valcartier Industries, Inc., Courcelette, Quebec, Canada, by said Aubry

Filed July 20, 1970, Ser. No. 56,499

Int. Cl. B07c *5/00*

U.S. Cl. 209—73 **24 Claims**



An inspection and transfer mechanism designed primarily for optically inspecting the surface of shell casings. The mechanism provides a continuous conveyor for conveying shell casings successively over a predetermined path. A mechanism is provided for raising a multiplicity of shells from the conveyor periodically and lifting them into preselected positions. A light and lens system projects a narrow, elongated light strip onto the shell casings at the preselected positions while the shells are being rotated about their longitudinal axis. A photocell system is positioned to detect light reflected from the shell and is designed with an electronic system to detect flaws in the sidewall of the casing, as determined by nonuniformity in the level of reflected light that is detected. Also provided in series with the sidewall, flaw-detecting means is a means for detecting an aperture or hole at the end of the shell and an ejection system responsive to detections of flaws.

3,712,467

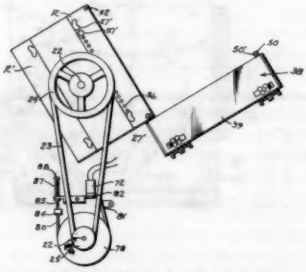
SEQUENTIAL CARD SORTING APPARATUS

Douglas W. Barnes, Denver, Colo., assignor to Littlcomputers, Inc., Denver, Colo.

Filed Oct. 26, 1971, Ser. No. 192,652

Int. Cl. B07c *5/34*

U.S. Cl. 209—110.5 **14 Claims**

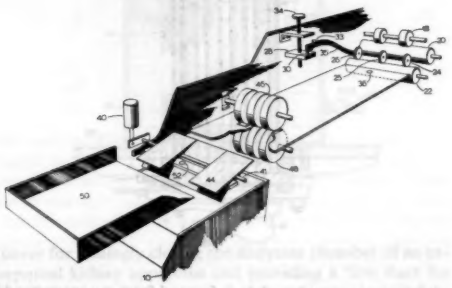


A sequence sorter is capable of rapidly sorting and grouping cards in numerical or alphabetical order or other predetermined sequence and is specifically adapted for use in connection with a centrifugal sorting device in which selected cards may be displaced from the storage tray into a supplementary tray, grouped together and replaced in the storage tray in a rapid succession of steps and in a minimum of time.

3,712,468
DEVICE WHICH SCANS AND DETECTS FOR CONTENTS IN A PACKAGE

William Wenner, 608 Delaware Ave., Lansdale, Pa.; Brian J. Stuhlmuller, 634 W. 70th St., Kansas City, Mo.; Ara Bouloutian, 2515 Turner Rd., Willow Grove, Pa., and Paul Zakarian, 3302 Windsor Ave., Norristown, Pa.

Filed Feb. 24, 1971, Ser. No. 118,369
Int. Cl. B07c *1/16*
U.S. Cl. 209—88 10 Claims



There is disclosed herein a device that scans for contents or lack of contents in an enclosed package such as a postal envelope and separates those items which have contents from those which do not. Contents or lack of contents are determined by sensing the thickness of the package over a specified length. If the detection of thickness occurs over a distance less that that specified, it is determined that the package has no contents and therefore, the package is directed into the "normal" receptacle. Conversely, those packages with contents are directed into the "exception" receptacle. The disclosed device also provides for the use of multiple sensors so that various portions of the enclosed package may be simultaneously scanned for thickness. Unless one or more of the sensors provides a positive indication of contents over the specified length and distance of travel, the device will again place the package in the "normal" receptacle.

There is also disclosed means of assuring that those packages which have been scanned for contents or lack of contents are correctly separated into the appropriate receptacle. If proper sorting does not occur, the device is automatically stopped.

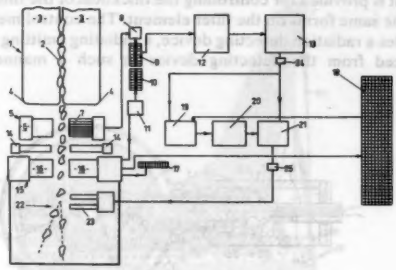
In addition, there is disclosed for inventory purposes an arrangement which counts the total pieces that are scanned by the device as well as those pieces which are sorted into the "exception" receptacle.

3,712,469
HIGH SPEED SORTING

Francis Bosworth Dwyer; Richard Lawrence Thompson, and Eberhard Wulff, all of East Roseville, Australia, assignors to The Colonial Sugar Refining Company Limited, Sydney, Australia

Filed Oct. 28, 1971, Ser. No. 193,255
Claims priority, application Australia, Nov. 5, 1970, 3106/70
Int. Cl. B07c *5/342*
U.S. Cl. 209—111.7 9 Claims

Apparatus for rapidly and reliably sorting valuable bodies from non-valuable bodies on the basis of a detectable parameter thereof. The apparatus comprises means for inferring the profile/locations and paths with respect to time of actually individual bodies when moving as a closely packed stream at a known rate; for obtaining value/location signals with respect to time diagnostic of value sources within the stream; for relating the time base value/location signals to actually individual bodies having corresponding time base profile/locations; for assigning valuable or non-valuable nominations to appropriate such bodies; and for precisely deflecting say the nominated valuable bodies from the stream. The invention is particularly applicable to the high speed sorting of size-classified rocks,

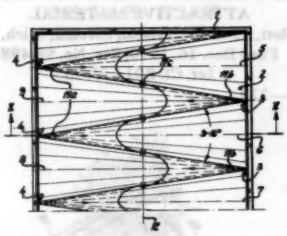


such as pieces of ore, and provides a technique of logically distinguishing between the component rocks of a clustered association moving as a spurious unit in the stream. By separating out the component rocks of a spurious unit, it becomes possible according to the invention precisely to assign value nominations thereto and to effect sorting with accuracy.

3,712,470
APPARATUS AND METHOD FOR REMOVING FOREIGN MATTER FROM A POOL OF LIQUID

Emil Gansloser, Grazer Strasse 26, 3 Hannover, Germany

Filed Oct. 23, 1970, Ser. No. 83,413
Claims priority, application Germany, Oct. 29, 1969, P 19 54 461.7
Int. Cl. C02b *1/18*
U.S. Cl. 210—61 7 Claims



An apparatus and method for removing foreign matter from a pool of liquid wherein a plurality of spaced nozzles are disposed in the opposite sidewalls of the pool for injecting streams of conically-shaped inoculum carrying liquid into the pool, the nozzles being arranged in the opposite sidewalls so that the outer surfaces of the streams from opposite nozzles intersect and slightly overlap such that the turbulence mixing regions of all the streams occupy approximately all of the liquid in the pool, with drain openings being located in the pool in those regions of least turbulence to remove the foreign matter from the pool.

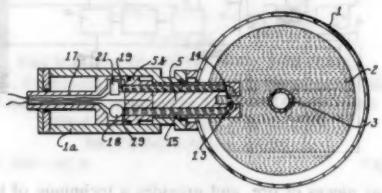
3,712,471
FILTER DEVICE

Hans Muller, Erlenbach, Zurich, Switzerland

Filed Nov. 21, 1969, Ser. No. 878,654
Claims priority, application Switzerland, Nov. 22, 1968, 17544/68; Dec. 16, 1968, 19106/68; Dec. 16, 1968, 19107/68
Int. Cl. B01d *29/02*
U.S. Cl. 210—107 4 Claims

A housing has mounted rotatably therein an elongated hollow upright shaft carrying one or more superimposed filter

elements which are themselves hollow and whose interior communicates with the interior of the shaft so that, when solids-containing liquids are admitted into the housing, the filtrate passes through the filter element into the shaft for evacuation and the solids are retained on the surface of the filter element and form a cake thereon. A control arrangement is provided for controlling the thickness of the filter cake as the same forms on the filter element. The control means includes a radiation detecting device, a radiating emitting device spaced from the detecting device in such a manner that



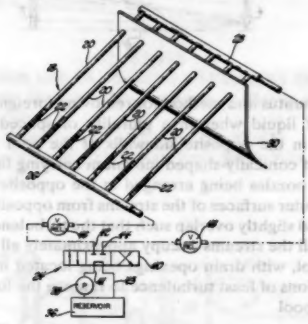
emitted radiation must traverse a predetermined path on its way to the detecting device, and carrying means which mounts the emitting and detecting devices and is movable between two positions in one of which at least a portion of the path extends above the upper surface of the filter element at a predetermined distance from the same corresponding to the desired maximum filter cake thickness, and another of which no portion of the path extends above this upper surface. Automatic means is also disclosed for controlling the operation of the filter device in dependence upon signals generated by the control means.

3,712,472

APPARATUS FOR HANDLING MAGNETICALLY ATTRACTIVE MATERIAL

Eldon G. Elliott, 32458 Maryland, Livonia, Mich.

Filed Dec. 16, 1970, Ser. No. 98,498
Int. Cl. B01d *35/06*
U.S. Cl. 210—222 **31 Claims**



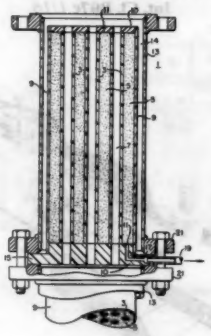
Apparatus for handling material by magnetic attraction comprising an elongated tubular member of nonmagnetic material with a magnet slidably received in the tubular member. The magnet is movable along the length of the tubular member between starting and dwell positions to carry magnetically attractive articles or material along the tubular member. A nonmagnetic barrier engages the tubular member between the starting and dwell positions to prevent the articles or material attracted by the magnets from moving past the position of the barrier as the magnet moves past the barrier to the dwell position.

3,712,473

REVERSE OSMOSIS MODULE

George W. Ellenburg, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 3, 1971, Ser. No. 120,587
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **5 Claims**



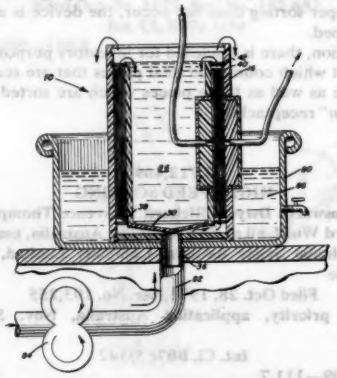
A reverse osmosis module is formed from a porous sand bar having a plurality of tubular osmotic membranes disposed in longitudinal holes therein, and having an enveloping membrane embracing the outer peripheral surface of the bar, the ends of the bar being sealed with epoxy. An effluent tap is provided and is in communication with the porous bar to drain the liquid which passes through the osmotic membrane, so that when the bar is submerged in an influent pressurized liquid, the pressurized liquid applies outwardly directed forces to the tubular osmotic membrane and inwardly directed forces on the enveloping membrane and on the epoxy ends of the bar, thus subjecting the bar to compressive forces only.

3,712,474

ARTIFICAL KIDNEY APPARATUS

Felix Jesus Martinez, Palatine, Ill., assignor to Baxter Laboratories, Morton Grove, Ill.

Filed April 8, 1970, Ser. No. 26,547
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **11 Claims**



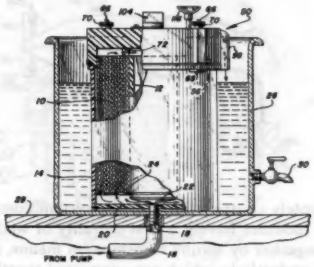
An artificial kidney apparatus providing a blood compartment which is entirely self-contained within its own structure. The apparatus further provides, in the self-contained assembly, structure to vary the positive pressure within a dialysate chamber and the pressure gradient across the diffusion membrane. Improved connector units provide uniform blood distribution into the diffusion membrane.

3,712,475

POSITIVE PRESSURE LID FOR DIALYZER APPARATUS

Felix Jesus Martinez, Palatine, Ill., assignor to Baxter Laboratories, Morton Grove, Ill.

Filed Aug. 31, 1970, Ser. No. 68,294
Int. Cl. B01d 31/00
U.S. Cl. 210—321 16 Claims



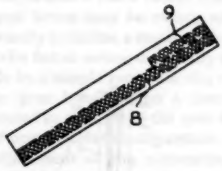
A cover for sealingly closing the dialysate chamber of an extracorporeal kidney apparatus and providing a flow duct for passing dialyzing fluid from the chamber. A valve in said flow duct to adjust the flow (volume/time) and vary the pressure within the dialyzing fluid compartment.

3,712,476

APPARATUS FOR THE GRANULOMETRIC SEPARATION OF GRANULAR, PULVERULENT MATERIALS

Richard Cohen-Alloro, 1, Passage des Geraniums, Orleans, and Roger Cuvillier, 74, rue de la Federation, Paris, both of France

Continuation of Ser. No. 784,357, Dec. 17, 1968, abandoned. This application April 14, 1971, Ser. No. 134,052
Claims priority, application France, May 7, 1968, 68150788
Int. Cl. B01d 29/04
U.S. Cl. 210—387 7 Claims



An apparatus for the granulometric separation of a granular product in suspension in a liquid, comprising an inclined stationary frame, and a flexible screening cloth supported on and extending across the frame so as to be similarly inclined therewith. A feeding means is positioned at the upper portion of the frame for delivering liquid and granular products suspension to the upper end of the screening cloth. A channel is provided beneath the cloth for receiving the screened liquid, and a channel is provided at the lower end of the cloth for receiving the separated granules.

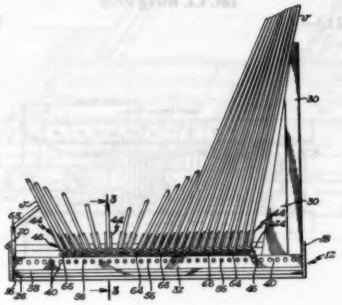
3,712,477

SELF-ACTUATING RECORD JACKET HOLDER

Garry Kieves, Apt. 410, 246 Rosalyn Rd., Winnipeg 13, Manitoba, Canada

Filed March 2, 1971, Ser. No. 120,085
Int. Cl. A47g 29/00
U.S. Cl. 211—40 9 Claims

This disclosure relates to a self-actuating record jacket holder including a base, first and second spaced elongated support means on the base, a multiplicity of holders each having a receiver portion, said holder having a first shaft on one end and a second shaft on the other end thereof, means mounting said shafts each on a support for pivotal movement thereon, and means connecting said holders one with the other whereby the pivotal movement of one holder causes the adjacent holder to pivotally separate from the adjacent holder.

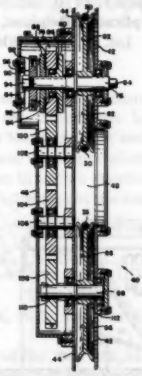


3,712,478

LOG YARDING SYSTEM AND METHOD

David G. Rennie, Burnaby, British Columbia, and Maurice J. McIntyre, Coquitlam, New Westminster, British Columbia, both of Canada, assignors to Skagit Corporation, Sedro-Woolley, Wash.

Division of Ser. No. 698,826, Jan. 18, 1968, Pat. No. 3,531,000, which is a continuation-in-part of Ser. No. 618,022, Feb. 23, 1967, Pat. No. 3,407,942. This application April 28, 1969, Ser. No. 819,680
Int. Cl. B66c 21/00
U.S. Cl. 212—89 4 Claims



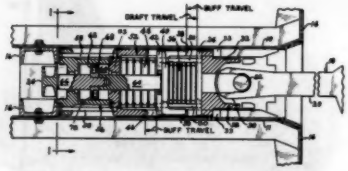
A system for yarding logs wherein a running skyline is rigged between a yarding tower and an outlying tail block. A suspension carriage rides on the running skyline and receives a two-part main line. A load line attaches to one part of the main line and extends over a load line sheave. The main line sheave and load line sheave are mechanically interconnected through a clutch and gear train so that the suspension carriage pulls slack in the load line.

3,712,479

RUBBER-HYDRAULIC DRAFT GEAR FOR RAILWAY CARS

Eulas R. Atkinson, Conroe, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,175
Int. Cl. B61g 9/08
U.S. Cl. 213—47 11 Claims



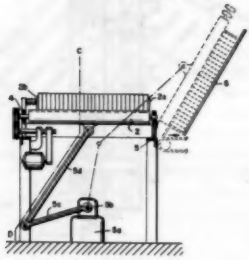
A draft gear for a railway car includes a first rubber draft gear having a movable pre-load plate at its forward end acted on by the coupler shank, and a second rubber draft gear having a front pre-load plate in contact with a rear follower plate of the first draft gear. A hydraulic cushion is fixed to the second draft gear and is in abutment with rear stops so that neither the hydraulic cushion or the second draft gear are movable bodily. The hydraulic cushion has a piston with valved buff and draft orifices and is fixed to a shaft which extends forwardly through the second draft gear into abutment with the rear follower plate of the first draft gear. Another portion of the shaft extends rearwardly into abutment with a yoke fastened to the coupler shank. The two draft gears and the hydraulic cushion act in the buff direction, but only the hydraulic cushion and the first draft gear act in the draft direction.

3,712,480

PROCESS AND MACHINE FOR THE TOASTING OF CUT BREAD

Marcel Georges Jean Houssa, 24 rue Marexhe, Liege, Belgium

Filed April 1, 1970, Ser. No. 24,549
Claims priority, application Belgium, April 2, 1969, 730,965
Int. Cl. B65g 7/00
U.S. Cl. 214—1 Q 6 Claims



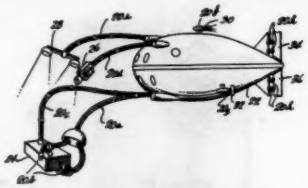
Apparatus and a process is disclosed for transporting bakery products from a cutter to a rebaking oven in automated fashion. The sliced material is received from a cutter, transported along a conveyer belt until a predetermined number of slices have been loaded on the belt and the load on the belt is thereafter inverted and deposited on a gravity feed mechanism for a rebaking oven.

3,712,481

ACTUATOR

Oliver P. Harwood, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation

Filed Dec. 23, 1971, Ser. No. 211,367
Int. Cl. B25j 1/02
U.S. Cl. 214—1 CM 13 Claims



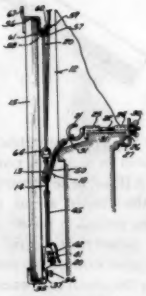
A remotely controllable actuator system comprised of one or more modules having a first plurality of wedge links connected together by torque transmission means, a second plurality of wedge links which are connected together by torque transmission means positioned between the links of the first plurality of wedge links and in sliding contact therewith and third torque transmitting means extending from one end of the module to the other. The module also may include controllable drive means for rotating the first plurality of wedge links with respect to the second plurality of wedge links to cause bending of the module in a predetermined plane and second drive means for driving said first and second pluralities of wedge links with respect to the third torque transmitting means to change the predetermined plane of curvature in which the module can bend.

3,712,482

STORM SASH HANDLER

Frank M. Bondowski, 3032 South 9th Place, Milwaukee, Wis.

Filed Nov. 24, 1970, Ser. No. 92,434
Int. Cl. B66f 9/00
U.S. Cl. 214—1 R 7 Claims



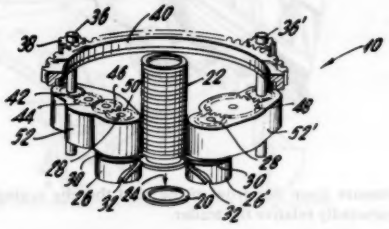
A harness formed of straps and accessories is adapted to be attached to storm sash. The harness is hooked to a bracket mounted on the window sill to support the storm sash after the operator has removed it from the window frame or preparatory to installing it in the window frame. In addition, a cable arrangement may be coupled to the harness for raising the storm sash to an upper level, and for removing a storm sash from a window and lowering it to another level.

3,712,483

FLAT ARTICLE FEEDING DEVICE, PARTICULARLY FOR FEEDING CAN COVERS FROM AND INTO A STACK

Clifford Harry Messervey, East Randolph, N.Y., assignor to The Borden Company, New York, N.Y.

Filed June 30, 1970, Ser. No. 51,198
Int. Cl. B65g 57/30
U.S. Cl. 214—6 BA 13 Claims



An article feeding device comprises means for rotatably supporting and driving a rotatable ring gear which is in rotatable meshing engagement with a plurality of circumferentially spaced planetary gears, preferably three equally spaced gears. The planetary gears are rotatably supported within a gear box on a shaft which is carried by a plate and it is arranged within a gear box which extends inwardly from the plate and may be swung about a pivotal axis corresponding to the axis of the planetary gear shaft. The gear box carries one or more idler gears which drives between the planetary gear and a driven gear carried on an article advancing drive shaft which also carries a parting knife and a rotatable article advancing member in the form of a cam having a screw groove for advancing the articles along the groove during rotation thereof. Articles such as flat can cover of any shape are arranged in a stack in a manner such that they are urged in a direction toward the rotational feeding member, for example, by gravity in the case of a vertical stack or by mechanical feeding in the case of a horizontal stack or when the device is to be employed for the feeding of the articles into a stack rather than out of a stack. The individual gear boxes may be swung so that all extend either further inwardly to define a small circle for engagement with the article to be fed or swung outwardly to define a larger engagement circle by a simple rotatable ring member which is connected to the gear box through a connecting rod and which may be rotated to shift all of the gear boxes simultaneously. Articles of non-circular configuration may also be fed by making an adjustment of the connecting rod length in respect to each individual gear box in order to vary the inner or outer position of one of the gear boxes and the associated feeding members. Each gear box also carries one or more idler gears which may be exchanged to provide variations in rotational feeding of the article advancing shaft and also provide for counter rotation of one of the advancing members in order to ensure for example that the articles are not rotated as they are fed.

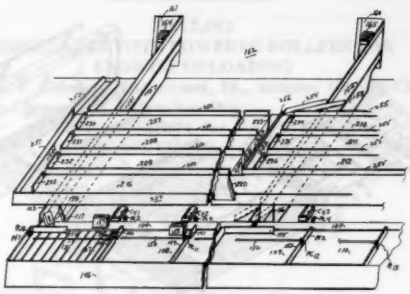
3,712,484

PACKAGE HANDLING SYSTEM AND SORTING APPARATUS

Eric C. Wahlbeg, 32 Eighth Street, Stamford, Conn.

Continuation-in-part of Ser. No. 829,936, June 3, 1969, abandoned. This application Aug. 25, 1971, Ser. No. 174,654
Int. Cl. B65g 43/00
U.S. Cl. 214—11 R 12 Claims

A package handling system comprising means for identifying each package, indiscriminate loading of packages into the transporting vehicle, indiscriminate unloading of packages from the transporting vehicle, and segregation into identifying categories in response to monitoring circuitry.

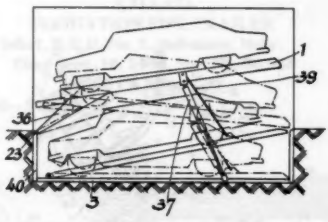


3,712,485

GARAGE

Kaspar Klaus, Schlachlhofstrasse 46, Memningen, Germany

Continuation of Ser. No. 35,495, May 7, 1970, abandoned, which is a division of Ser. No. 872,431, Oct. 29, 1969, which is a continuation of Ser. No. 611,003, Jan. 23, 1967, abandoned. This application Oct. 1, 1971, Ser. No. 185,824
Int. Cl. E04h 6/06
U.S. Cl. 214—16.1 ED 2 Claims



A garage including two mobile platforms for motor vehicles arranged one above the other, the lower platform being rotatable about an axis located at the end remote from the entrance to the garage, and the upper platform being connected with the lower platform in such a manner that either platform can be selectively placed adjacent the entrance.

3,712,486

STACKER ASSEMBLY FOR CORRUGATED SHEETS AND THE LIKE

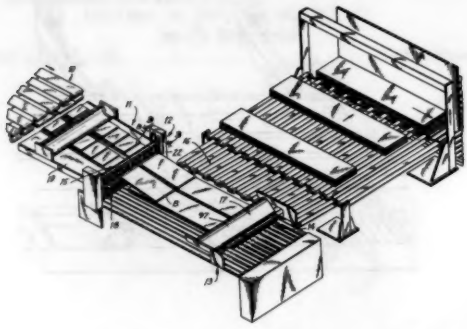
John Lopez, Westfield, N.J., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 186,310, Oct. 4, 1971. This application Feb. 7, 1972, Ser. No. 224,050
Int. Cl. B65g 57/09
U.S. Cl. 214—6 S 5 Claims

An improved stacker assembly including an oscillating squaring bar and control means therefor for achieving an improved orientation of stacked sheets to assure perfect lead edge alignment thereof, while enabling the stacked sheets to be readily removed without interference from the squaring means.

The squaring bar is cyclically engaged with the trailing edges of sheets disposed on a storage table to urge the lead edges of the sheets against an alignment bar disposed

downstream therefrom, the control means assuring that the squaring bar will be spaced from the trailing edges of the



sheets when operation of the apparatus is interrupted for lateral unloading of the formed stacks.

3,712,487

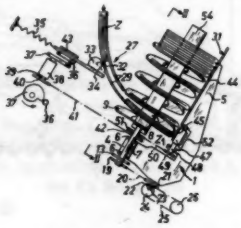
APPARATUS FOR STACKING FLAT SURFACE-LIKE OBJECTS

Jurg Eberle, Zurich, Switzerland, assignor to Ferag, Fehr & Reist AG, Zurich, Switzerland

Filed Feb. 19, 1971, Ser. No. 116,954

Int. Cl. B65g *57/30*

U.S. Cl. 214—6 BA **12 Claims**



There is disclosed an apparatus for stacking substantially flat surface,like objects, particularly paper products, comprising at least one worm-like conveying element driven to rotate about its longitudinal axis and extending between an infeed station and a delivery station for the objects. According to an important aspect of the invention, the conveyor element is constructed as a spiral or screw surface traveling about a cylindrical hollow compartment.

3,712,488

LAUNCHING DEVICE FOR BOAT TRAILERS

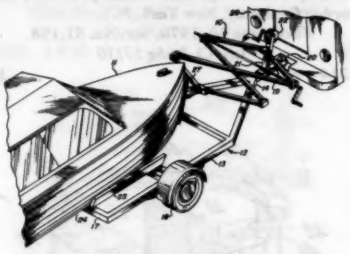
Leon F. Steves, 1181 Meade Lane, Flagstaff, Ariz.

Filed Oct. 28, 1971, Ser. No. 193,269

Int. Cl. B60p *3/10*

U.S. Cl. 214—82 **5 Claims**

A launching device detachably mountable upon the stanchion of a boat trailer to exert force upon the prow of the boat to push the boat rearwardly relative the trailer to launch the boat when the rear portion of the trailer is immersed in water. The device comprises a series of pivotally joined pairs of arms which are capable of extension and retraction in scissors fashion. A crank means rotates a screw which threadedly engages with corresponding pivots to forceably move said pivots alternately closer and farther to effect the contraction and expansion of the device. Expansion of the device exerts



pressure upon the prow of the boat thereby urging said boat rearwardly relative the trailer.

3,712,489

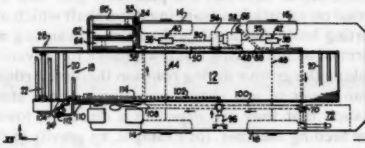
FLUID PROPELLED MINE HAULAGE VEHICLE AND METHOD FOR UNDERGROUND HAULAGE

Will B. Jamison, Bethel Park, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed July 1, 1971, Ser. No. 158,829

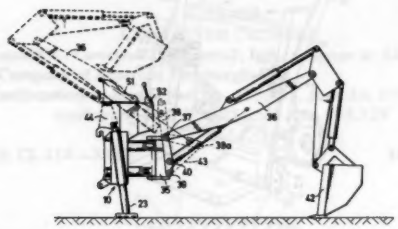
Int. Cl. B60p *1/38*

U.S. Cl. 214—83.36 **7 Claims**



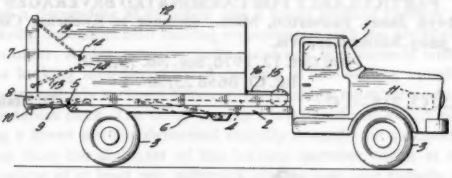
The underground mine haulage vehicle is particularly adapted for use as a shuttle vehicle between a continuously advancing loading station and a fixed discharge station to transport material dislodged by the continuous mining machine at the loading station to fixed conveying apparatus at the discharge station. The mine haulage vehicle has a mobile body with pairs of front and rear traction wheels. A fluid actuated motor is connected through suitable driving connections to the traction wheels. Accumulators having fluid under pressure therein are connected to the fluid actuated motor and the fluid under pressure from the accumulators actuates the fluid motor and propels the shuttle vehicle. The fluid circuit includes a fluid inlet connection to the accumulators and a fluid outlet connection from a reservoir. At a recharging station located adjacent to the fixed discharge station a suitable recharging device is provided for recirculating the fluid from the reservoir to the accumulators and compressing the gas in the accumulators to recharge the accumulators with fluid under pressure. Other embodiments include providing a pump on the haulage vehicle to transfer the fluid from the reservoir to the accumulators and recharging the accumulators with fluid under pressure. A separate electric motor for the recharging pump is located adjacent the fixed discharge station and is connected thereto to energize the pump while the vehicle is discharging the dislodged material. In another embodiment the fluid actuated motor is also operable as a pump to transfer fluid from the reservoir to the accumulators. A separate circuit may be provided from the external recharging means to a drive motor for the conveyor so that the conveyor may be driven by the external recharging means while the fluid system is being repressurized.

3,712,490
MECHANICAL SHOVEL ATTACHMENT
Hans Schaeff, 7183 Langenburg, Wurttemburg, Germany
Filed March 22, 1971, Ser. No. 126,690
Claims priority, application Germany, March 23, 1970, P 20 13 849.2
Int. Cl. B66f 9/00
U.S. Cl. 214—138 C 10 Claims



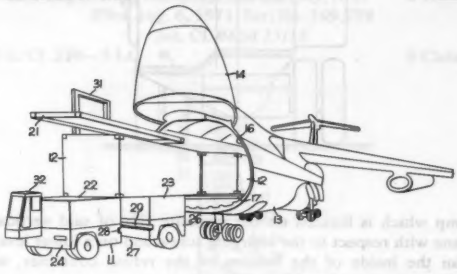
An attachment for mechanical shovels and the like having a lever pivotable relative to a rotating column. An arm pivotally connected to the lever and a hydraulic cylinder working in conjunction with the arm, lever and locking means for moving a shovel from a working position to a travelling position.

3,712,491
DUAL PURPOSE DUMP AND TRANSPORT VEHICLE
Thomas F. Kreutzer, Yonkers, N.Y., assignor to L.S.T. Enterprises, Bronx, N.Y.
Filed Oct. 18, 1971, Ser. No. 189,968
Int. Cl. B60p 1/28
U.S. Cl. 214—505 19 Claims



A dump and transport vehicle having a tiltable platform with a hinged tail gate having ramp means positioned on the underside thereof and mechanical means for securing a storage container to the upper, inner side thereof. Hydraulic means are provided to tilt the platform upwardly at the front end thereof and for moving the tail gate from its closed position to open positions including a fully open position in which the tail gate forms a planar extension of the platform. With the storage container secured to the tail gate and said gate extended to its fully open position reaching to the ground, with the ramp means in a retracted position, dumping of material from the storage container is facilitated. With the ramp means in its extended position extending from the fully open tail gate and reaching to the ground, the angle of inclination of said ramp means, tail gate and tilted platform is minimized, facilitating the loading and unloading of objects to be transported on said vehicle. The tail gate and the ramp means are provided with openings through which locking pins on the storage container are placed, the openings in the ramp means being key-shaped to permit the ramp means to be moved to a lock position in which said locking pins are precluded from passing back through said openings, thus securing said storage container to the tail gate for convenient movement to dumping and loading positions. By moving the ramp means to an unlock position, the storage container can be moved on the platform so as to remove the locking pins from the ramp means and the tail gate, permitting the ramp means to be moved to its extended position forming an extension of the tail gate, permitting the platform to be lowered to a lower position facilitating loading and unloading of said storage container or other objects to be transported on the vehicle.

3,712,492
SIDELOADER WITH POWERED ROLLERS FOR ENDWISE UNLOADING
Samuel T. Comfort, Homewood, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed July 1, 1971, Ser. No. 158,855
Int. Cl. B60p 1/52
U.S. Cl. 214—518 3 Claims



A sideloader lift truck is provided with powered rollers on fore and aft decks which are either elevatable or constructed to be at the same height as the load floor of an aircraft. The sideloader truck is especially useful in loading cargo into end loaded cargo aircraft.

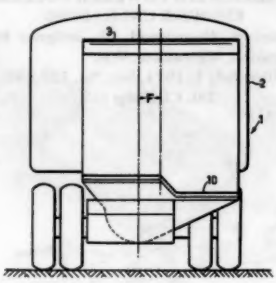
3,712,493
IRRIGATION PIPE TRAILER
Erwin E. Priefert, R.F.D. No. 1, Belvidere, Nebr.
Filed Sept. 10, 1970, Ser. No. 70,956
Int. Cl. B60p 1/64
U.S. Cl. 214—515 9 Claims

A trailer adapted to be towed by a towing vehicle such as a farm tractor and including a pipe rack and a two-wheeled carrier detachably interconnected to enable the rack to be used for storage purposes as well as transport of the pipe. The rack and carrier are releasably interconnected and include a turntable construction to enable the rack to rotate in relation to the carrier about generally a vertical axis for reversing the irrigation pipe on the rack. The carrier includes vertically adjustable supporting wheels to enable attachment and detachment of the carrier and also raising and lowering of the carrier to raise and lower the rack when engaged therewith.

3,712,494
REFUSE CONTAINERS WITH AN EMPTYING HOOD AND A CHARGING SCREW
Georg Lindeborg, Blomstermala, Sweden, assignor to Norba Aktiebolag, Blomstermala, Sweden
Filed Oct. 9, 1970, Ser. No. 79,598
Claims priority, application Sweden, Oct. 9, 1969, 13859/1969
Int. Cl. B60p 1/42
U.S. Cl. 214—519 7 Claims

A refuse container, which may be mounted on a vehicle, has an emptying hood provided with a charging screw which has

its rotational axis located beside a vertical plane substantially parallel to said rotational axis, through the center of the emptying hood, as well as with an opening for manual loading of refuse. Said loading opening comprises a lowered loading



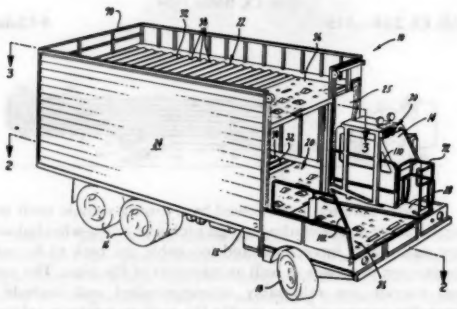
ramp which is located on the opposite side of said vertical plane with respect to the charging screw and on a lower level than the inside of the bottom of the refuse container, to facilitate loading thereof.

3,712,495

CARGO TRANSPORTER

Victor H. Carder, Carmel, and Robert J. Notman, Salinas, both of Calif., assignors to Cochran Western Corporation, Salinas, Calif.

Filed Nov. 3, 1970, Ser. No. 86,475
Int. Cl. B60p *1/44*
U.S. Cl. 214—520 **8 Claims**



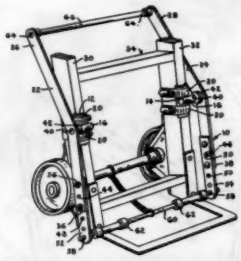
Mobile apparatus for loading and unloading aircraft, particularly for loading, transporting and unloading cargo containers of the preloaded module type. A mobile vehicular frame powered for movement over the ground is provided with vertically spaced fixed loading platforms and an elevator platform mounted for movements between positions of registry with said fixed loading platforms. Each of the fixed and elevator loading platforms is provided with powered, independently operable conveying means. The elevator platform carries controls for the elevator hoist and the drives for the conveying means. The conveying means of the fixed loading platforms are alternatively actuated by movement of the elevator platform from one position of registry to the other. Using the elevator platform, empty cargo modules discharged from the aircraft can be loaded onto one of the fixed loading platforms, and full cargo modules (e.g., galley modules) can be unloaded from the other fixed platform for transfer into the aircraft.

3,712,496

PUSH-OFF DEVICE FOR HAND TRUCK

Terry G. Miller, 1469 Campbell Road, No. 40, Houston, Tex.

Filed April 14, 1971, Ser. No. 133,896
Int. Cl. B62b *1/09*
U.S. Cl. 214—511 **1 Claim**



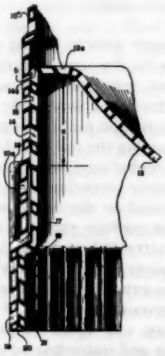
A push-off mechanism for attachment to any size hand truck comprising individual pivot support members removably connected by means of clamps to the side members of the hand truck. Lever bars removably mounted on the pivot support members on the straddle side of the side member of the hand truck. The bottom end of each lever bars provided with longitudinally extendable members, the distal ends of which have means for supporting a laterally extending shaft which serves as the kick-off member. The top end of the lever bars have means for connecting a laterally extending shaft for manually pivoting the lever bars.

3,712,497

THIN WALLED THERMOPLASTIC PRESSURE VESSELS PARTICULARLY FOR CARBONATED BEVERAGES

Elwyn Jones, Beaverton, Mich., assignor to Koehring Company, Milwaukee, Wis.

Filed Oct. 12, 1970, Ser. No. 79,910
Int. Cl. B65d *23/00*
U.S. Cl. 215—1 C **10 Claims**



A bottle, particularly for carbonated beverages such as conventional soft drinks and beer, and formed of thin walled, flexible, synthetic plastic parts which are differential pressure formed in heated thermoplastic webs and then severed therefrom, and comprising generally: an upper side wall portion having a neck from which the beverage or the like may be poured, and a generally convex bottom wall for the bottle or vessel having a continuous peripheral flange telescopically received within the lower end of the side wall portion. The external diameter of the upper portion of the flange is slightly greater than the interior diameter of the section of the side

wall portion in which it is received so as to be received therein with an interference fit, the parts being friction welded together to dispose friction weld material between the upper portion of the flange and the side wall at the periphery of the convex bottom wall to securely bond the parts together. Another embodiment of the invention is disclosed in which the side wall portion is formed of telescopically interfitted and friction welded upper and lower sections.

3,712,498

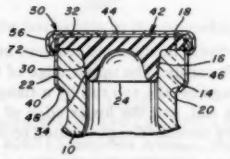
CONTAINER CLOSURE

Kenneth C. Lawrence, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 155,731, June 23, 1971. This application Oct. 27, 1971, Ser. No. 193,129

Int. Cl. B65d *41/42*

U.S. Cl. 215—38 R **16 Claims**



A container assembly for providing a sterile sealed container including a container having a neck provided with an annular mouth defining bead and a multipiece closure having a sealing member, a locking member and a cover secured thereto. The mouth defining bead has an upper surface, an exteriorly disposed downwardly and inwardly inclined closure anchoring shoulder defining surface and an outer surface connecting the upper surface with the shoulder defining surface. The locking member has a top panel with an opening therein and a depending skirt which has a lower surface radially inwardly deformed into locking engagement with the anchoring shoulder. At least two radially outstruck lugs formed within the locking member skirt. A portion of the sealing member compressively secured between the locking member and the container neck. The cover having a top panel and a skirt having a lower portion deformed radially inwardly to a diameter less than the diameter of the locking member taken at the position of at least one outstruck lug. At least one radially inwardly directed embossment formed in the cover skirt at a height generally the same as the lugs. Rotation of the cover with respect to the locking member causes the embossment to permanently inwardly reform the outstruck lugs and permit relative axial separation of the closure and locking member.

3,712,499

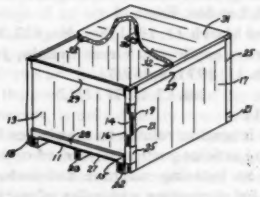
PALLET-TYPE SHIPPING CONTAINERS

William Lewis Talbert, York, Pa., assignor to Canton Company of Baltimore, Baltimore, Md.

Filed Dec. 22, 1970, Ser. No. 100,631

Int. Cl. B65d *9/24, 9/34*

U.S. Cl. 217—12 **2 Claims**



A pallet type shipping container comprises a pallet with floor boards which extend a short distance beyond the pallet runners, and side panels so notched as to form a box joint at the corners. Panels are locked together by angular corner posts which engage slots on the side of the panel. Lifting the panels off the pallet is prevented by an inwardly facing reinforcing strip on the side panels which locks under the overhanging portion of the pallet floor boards. Knocked-down panels lie flat for return shipment.

3,712,500

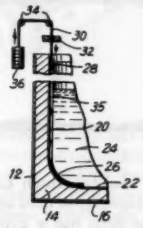
LINER FOR CRYOGENIC CONTAINER

Tadeusz Josef Marchaj, New York, N.Y., assignor to The Preload Engineering Company, Garden City, N.Y.

Filed Aug. 6, 1971, Ser. No. 169,779

Int. Cl. B65d *25/18*

U.S. Cl. 220—9 LG **9 Claims**



A flexible liner for cylindrical, liquid natural gas tanks is shown. The liner includes a curved juncture member for joining the bottom and side plates of a conventional liner. The juncture member has an elongated, radial corrugation projecting inwardly which has a plurality of transverse corrugations in it. The juncture member absorbs multidirectional stresses due to thermal expansions and contractions and varying static pressures in the tank.

3,712,501

PRESSURE-RESPONSIVE SAFETY DEVICE FOR AEROSOL DISPENSER AND CONTAINERS EQUIPPED THEREWITH

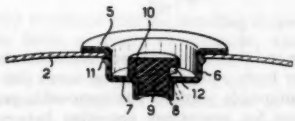
Bruno P. Morane, Paris; Charles Paoletti, Aulnay sous Bois; Manlio Maurelli, Vaujours; Louis Merrien, Fontenay sous Bois, and Robert Sathicq, Villepinte, all of France, assignors to L'Oreal

Filed June 5, 1970, Ser. No. 43,696

Claims priority, application France, June 10, 1968, 6919182; Sept. 1, 1969, 6929795

Int. Cl. B54d *25/00*

U.S. Cl. 220—85 R **3 Claims**



A safety device for a container under pressure comprises a resilient member to be positioned in the container wall and formed with a valve opening. A plug is positioned in the opening to normally close it, but the resilient member will flex to permit the release of fluid through the valve opening past the plug in response to excess pressure.

3,712,502

COMPARTMENTED TANKER AND METHOD OF CONSTRUCTING THE SAME

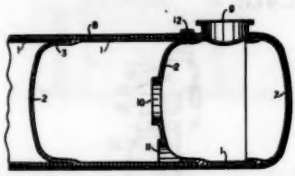
Robert Basier, Saudemont, and Clovis Parisot, Douai, both of France, assignors to Societe Anonyme De Recherches Et De Commercialisation De Produits De Resines De Synthese R.C.P. and Housilleres Du Bassin Du Nord Et Du Pas De Calais, Douai, Nord, France

Division of Ser. No. 837,970, April 3, 1969, Pat. No. 3,615,999. This application June 5, 1970, Ser. No. 43,784

Claims priority, application France, July 10, 1964, 6418451; April 16, 1965, 6518556

Int. Cl. B65d *1/24*

U.S. Cl. 220—20 1 Claim



A compartmented tanker, which comprises a cylindrical outer member, and a plurality of cells are disposed in the outer member. Each of the cells has a cylindrical portion and a curved bottom portion and engages the inner face of the outer member along at least a part of the outer face of the cylindrical portion of the cells. The curved bottom portion of each of the cells forms an outer recess substantially at the point of reaching the cylindrical portion thereof, and recess is adapted to receive sealingly and flush the cylindrical portion of the next adjacent cell.

3,712,503

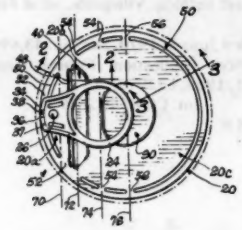
FULL OPEN END CLOSURE

Arthur P. Zundel, Chicago, Ill., assignor to National Can Corporation, Chicago, Ill.

Filed Nov. 3, 1971, Ser. No. 195,095

Int. Cl. B65d *17/20*

U.S. Cl. 220—54 9 Claims



A full open end that is permanently seamed onto one end of the container body with a peripheral score line in the end defining a removable section. The removable section incorporates means for preventing crowning between opposite edges of the section as the section is removed from the container body.

3,712,504

CONTAINER WITH REMOVABLE SIDE PANELS

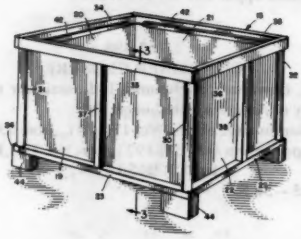
John E. Petersen, Route 3, P.O. Box 6, Lake Wales, Fla.

Filed Aug. 30, 1971, Ser. No. 175,951

Int. Cl. B65d *7/42*

U.S. Cl. 220—84 14 Claims

A container is provided with at least one removable side panel which can be pushed inwardly when struck with a blow. The container includes a generally rectangular bottom wall and four upwardly extending corner posts which support top rails extending between the corner posts. A side panel extends between each pair of adjacent corner posts and between the bottom wall and the top rail, and at least one of the side panels



is formed of relatively flexible and resilient material to permit it to be bowed inwardly. The upper edge of this side panel is releasably held against the top rail by a flange secured to the inside of the top rail, and the lower edge of the side panel is releasably held by another flange secured to the bottom wall.

3,712,505

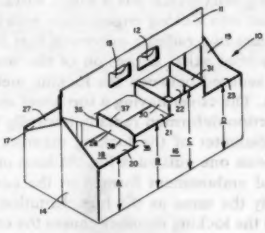
CONTAINER CARRIER

Julian B. Slevin, 300-14 East Baltimore Avenue, Lansdowne, Pa.

Filed Sept. 1, 1971, Ser. No. 176,962

Int. Cl. B65d *75/00*

U.S. Cl. 220—111 7 Claims



A carrier is provided, for containers such as bottles and the like, the carrier being of paperboard or like construction, and being formed by folding the same from a blank, to have at least eight cells for receiving bottles or the like therein, the cells being spaced by separators in such a manner as to comprise a novel overall construction.

3,712,506

MAGAZINE

Thomas Duncan Brownbill, London, England, assignor to John Dale Limited, London, England

Filed March 23, 1971, Ser. No. 127,303

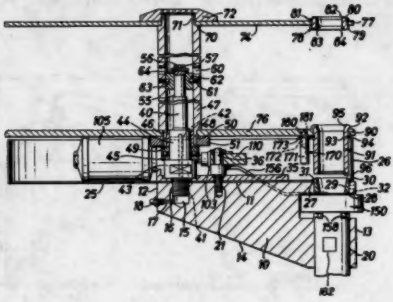
Claims priority, application Great Britain, June 18, 1970, 29,700/70; Feb. 11, 1971, 4,459/71

Int. Cl. G07f *11/12*

U.S. Cl. 221—11 5 Claims

The present invention relates to magazines for dispensing stacks of nesting articles particularly flared or tapered collapsible tubes to an indexing machine and includes magazine storage means for supporting a plurality of stacks of said articles in a dispensing position, indexing means for moving said storage means and sequentially presenting each of said stacks at a dispensing station, sensing means for sensing a passage of

the last article in a stack at said dispensing station and lowering means juxtaposed said dispensing station to lower said



stack to enter the last article in the preceding stack at a controlled rate.

3,712,507

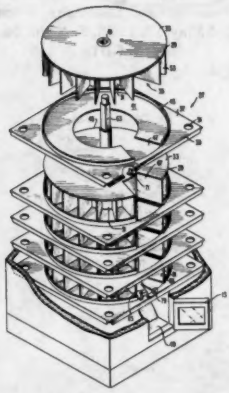
ARTICLE DISPENSING APPARATUS AND METHODS

Wythe W. Holt, 4202 Chesapeake Avenue, Hampton, Va.

Filed April 26, 1971, Ser. No. 137,561

Int. Cl. G07f *11/54*

U.S. Cl. 221—82 **17 Claims**



Provided is an apparatus for manually or automatically dispensing articles. The apparatus is especially useful for dispensing large bags of ice and generally comprises at least two drums having a common vertical axis about which the drums rotate. Each drum is provided with a plurality of radially extending compartments about its periphery. A stationary shelf is located below the compartments of each drum for retaining the articles in the compartments. When the drums rotate the articles located in the compartments slide along the shelf. Each shelf is provided with an opening vertically aligned with the openings of all other shelves, such that when a compartment containing an article is caused by drum rotation to pass over the opening, the article is dispensed from the apparatus. The drums are rotated by a rotatable vertical shaft extending along the common vertical axis of the drums. The vertical shaft, however, is only directly connected to the uppermost drum. Dispensing starts with the rotation of the uppermost drum only, which drum upon becoming empty, engages the next lower drum whereupon continued rotation of the uppermost drum by the rotatable vertical shaft also causes this next lower drum to rotate and dispense. Like engagement of each empty upper drum with its lower drum continues until the apparatus is empty of articles.

3,712,508

LIGHTED MATCH DISPENSER

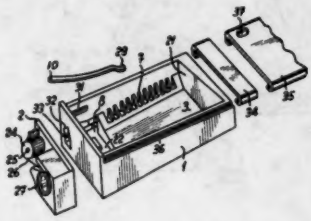
Jean Bargoin, Thiers, France, assignor to Unimeco Anstalt, Vaduz, Liechtenstein

Filed Sept. 21, 1970, Ser. No. 73,986

Claims priority, application France, Oct. 10, 1969, 6934895

Int. Cl. A24f *29/00*

U.S. Cl. 221—141 **6 Claims**



A lighted match dispenser comprises a match container and means to move matches one-by-one, head end first, in striking contact against a flexible striking band. The match head presses the band against the periphery of a rotatable drum with a component of force peripherally of the drum sufficient to cause a small rotation of the drum and a small advance of the flexible band. In this way, the band is automatically advanced so that fresh portions are presented to subsequent match heads. Continued movement of the match in the same direction extends the match out of the dispenser, lighted end first, to a position in which it can be grasped and removed by the user.

3,712,509

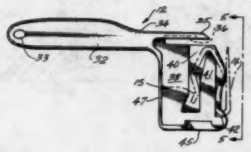
DRAPERY PINHOOK TOOL WITH MOVABLE MAGAZINE

Adam P. Niel, Los Angeles, Calif., assignor to George F. McMurray, Glendale, Calif.

Filed March 30, 1971, Ser. No. 129,510

Int. Cl. B25c *5/00*

U.S. Cl. 221—197 **6 Claims**



A handheld two-piece tool for installing drapery pinhooks. A magazine holds a supply of pinhooks, and is slidably mounted on a handle to deliver a pinhook to a retainer on the handle which places the pinhook in a driving position. The movable magazine simplifies construction of the tool and eliminates separate drive plates used in conventional tools.

3,712,510

PILL AND CAPSULE DISPENSER

Paul A. Lindahl, Overland Park, Kans., assignor to Bi-Be-Lo, Inc., Kansas City, Mo.

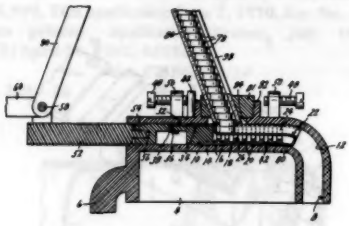
Filed Nov. 26, 1971, Ser. No. 202,503

Int. Cl. B65g *60/00*

U.S. Cl. 221—260 **10 Claims**

A pill and capsule dispenser consisting of a hopper from which pills or capsules are fed by gravity into a loading tube, from which they are in turn deposited one at a time in a flexi-

ble insert carried by a reciprocable slide carried in a dispenser case, the insert and slide being movable between a first position for receiving a single pill or capsule from the loading tube, and a second position in which the insert is flexibly deformed to allow the single pill or capsule to be delivered to a suitable container by gravity, and powered mechanism operable both



to reciprocate the slide and insert between the first and second positions, and also to agitate the hopper to facilitate feeding of pills or capsules from the hopper to the loading tube. Interchangeable loading tubes and slide inserts permit adaptation of the device to dispense a wide variety of sizes and shapes of pills and capsules.

3,712,511

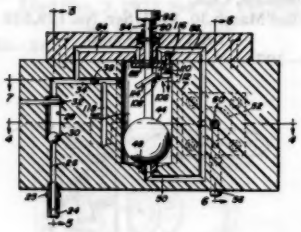
POOL CHLORINATOR

Peter L. Magnasco, 730 West Bucknall Road, Campbell, Calif.

Filed Oct. 5, 1970, Ser. No. 78,096

Int. Cl. E04h *3/20*

U.S. Cl. 222—52 **9 Claims**



A chlorinator for feeding a liquid chlorine solution to a swimming pool from a supply tank. The chlorinator includes a flow scale, a check valve to prevent back flow, a flow control, automatic cut-off means to prevent air entering the pump system of the pool, a primer to reactivate the chlorination system, and means for enabling operation of the chlorinator either continuously or cyclically in conjunction with the pool pump system.

3,712,512

LATHER PRODUCING MACHINE

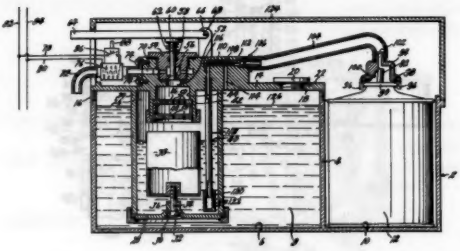
John H. Snider, Jr., Box 363, Route 2, and Harold H. Snider, Box 101, Route 2, both of Osceola, Mo.

Filed April 26, 1971, Ser. No. 137,251

Int. Cl. B67d *5/08*

U.S. Cl. 222—67 **5 Claims**

A lather producing machine consisting of a body member having a liquid soap reservoir and a reservoir for gas under pressure therein, and a nozzle for the discharge of lather connected with said liquid soap reservoir, the pressure of said gas being responsive to the opening of a discharge valve at said nozzle, to bubble gas through a portion of said liquid soap to form coarse bubbles therein, and to force said bubbles



through very small orifices in a lather generator to reduce the size thereof to the very small size required for rich lather, and to discharge said lather through said nozzle, said gas pressure being the sole operative force. An electric heater may be provided when it is desired that the finished lather be hot.

3,712,513

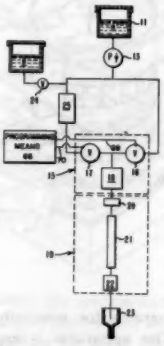
APPARATUS AND METHOD FOR GRADIENT ELUTION

Howard L. Ashmead; Sydnor H. Byrne, Jr., both of Newark, Del., and John P. Wolf, III, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 12, 1970, Ser. No. 36,633

Int. Cl. G01n *21/06*

U.S. Cl. 222—134 **12 Claims**



The use of separate supply means for each of two liquids and a proportioning means comprising a mixing region, valving means connected to the mixing chamber to control the flow of each liquid to the mixing region, and a means for periodically controlling the operation of the valving means to control the amount of each liquid supplied to the mixing region during each period of valve operation, produces a supply of eluent having a precisely controlled time varying concentration of each liquid.

3,712,514

PORTABLE BEER DISPENSER

Robert B. LeBlanc, 15411 Englewood Ave., Allen Park, Mich.

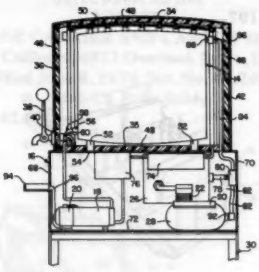
Filed March 29, 1971, Ser. No. 128,791

Int. Cl. B67d *5/62*

U.S. Cl. 222—146 C **12 Claims**

The invention provides a refrigerated compartment for a keg of beer, a compartment for housing a refrigeration system

operatively connected with the refrigeration compartment, an air compressor system including a surge tank, and a tank of carbon dioxide, each cooperatively connected to the keg of



beer for charging the same under pressure. The entire assembly is unitized into a movable carrier and is further provided with a manually-operated discharge faucet for serving beer from the keg.

3,712,515

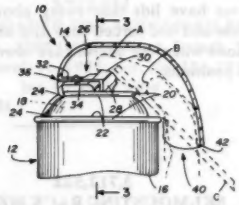
CHILD-SAFE AEROSOL SPRAY CONTAINER

James A. Corll, 4029 Simms Avenue, S.E., Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 790,727, Jan. 13, 1969, Pat. No. 3,554,366. This application Sept. 1, 1970, Ser. No. 68,673

Int. Cl. B65d *83/14*

U.S. Cl. 222—182 **20 Claims**



A child-safe aerosol spray container includes a curved cover secured to an aerosol spray container and surrounding the actuator thereof. The cover extends to an aperture positioned farther from the actuator than the length of a child's finger and having a diameter smaller than that of a child's hand. Thus, the cover prevents operation of the aerosol spray container by a child while permitting operation by an adult. Also, the curve of the cover prevents operation of the container by foreign objects that a child might employ.

3,712,516

MECHANISM FOR EJECTING PLASTIC MATERIALS

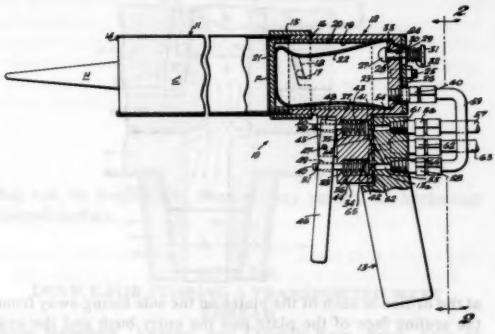
Melvin W. Stamets, 1 Dellwood Court, Ramsey, N.J., and Charles E. Clauss, 1048 West Emaus Avenue, Allentown, Pa.

Filed Nov. 12, 1971, Ser. No. 198,291

Int. Cl. G01f *13/00*

U.S. Cl. 222—326 **7 Claims**

An improved gun-handle type water pressure actuated mechanism for ejecting plastic materials from ordinary nozzle-ended cylindrical cartridges is described. A trigger-like lever when squeezed in the inward direction opens a first valve, permitting water under pressure supplied through an ordinary garden hose to fill and expand an expansible bladder constrained in the gun body so as to exert a force against a plunger adapted to engage and push inwardly upon the piston of a cartridge supported by the gun body, and thereby express the contained material through the cartridge nozzle. When the trigger lever is moved outwardly of the handle, a second valve is actuated to enable water under pressure within the bladder



to escape through a flexible drain hose, thereby immediately releasing any pressure being exerted on the cartridge piston to stop the flow of material.

3,712,517

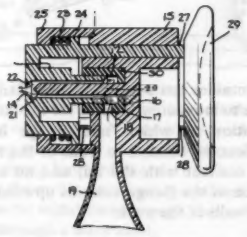
TRIPLE SEAL VALVE

Richard L. Davenport, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed April 21, 1971, Ser. No. 135,975

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.13 **7 Claims**



A discharge valve for a pressurized container is provided with a telescoped axially movable tubular nozzle which cooperates with a sidewall aperture in a stationary elastomeric encircling sleeve for controlling the egress of material. A valve stem within the nozzle cooperates with a discharge orifice at the outer nozzle end to seal same when the nozzle is in valve closing position and to expose same when the nozzle is moved to valve open position thereby preventing nozzle clogging.

3,712,518

SLIDING GATE NOZZLE FOR VESSELS USED FOR POURING METALS

Ernst Meier, Adliswil, Zurich, Switzerland, assignor to Interstop AG, Zug, Switzerland

Filed Oct. 1, 1970, Ser. No. 77,198

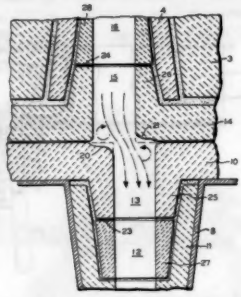
Claims priority, application Germany, Oct. 13, 1969, P 19 51 447.7

Int. Cl. B67d *3/00*

U.S. Cl. 222—561 **1 Claim**

A sliding gate assembly for a vessel used for pouring metals containing replaceable refractory wearing parts. A casing has an outlet and an entry bush therein. A stationary bedplate is fixed to the casing having a first orifice aligned with the outlet. A sliding plate has a second orifice controlling the first orifice. An exit bush is connected to the sliding plate. The orifices in the bed plate and in the sliding plate are offset from the lon-

gitudinal centers of the plates and the two plates have cooperating sealing faces for closing the cooperating orifices located at the longer ends of the two plates. A boss is provided



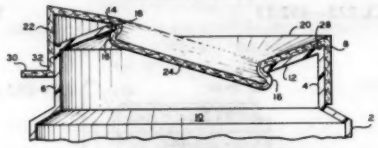
at the orifice in each of the plates on the side facing away from the sealing face of the plate and the entry bush and the exit bush associated with the plates have a socket for receiving the boss associated therewith.

3,712,519

CONTAINER AND CLOSURE

Stafford D. Collie, Glen Ellyn, Ill., assignor to Phillips Petroleum Company

Filed June 25, 1970, Ser. No. 49,774
Int. Cl. B65d *47/60*
U.S. Cl. 222—563 5 Claims



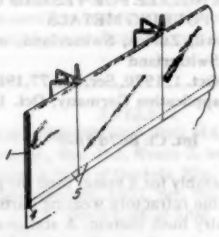
A plastic container has a frusto-conical flange that is movable in response to movement of a lid for the container between a closed position at which said flange is inwardly and downwardly directed relative to walls of the neck of the container and in contact with the lid, and an open position at which a portion of the flange extends upwardly and inwardly relative to the walls of the neck.

3,712,520

PLEATING OF SHEET AND TEXTILE MATERIALS

Richard Gabriel Vipond, Brackens Bishops Walk, Addington, England

Filed Oct. 12, 1970, Ser. No. 79,719
Claims priority, application Great Britain, Oct. 13, 1969, 50,164/69
Int. Cl. A41b *43/00*; D06j *1/00*
U.S. Cl. 223—34 4 Claims



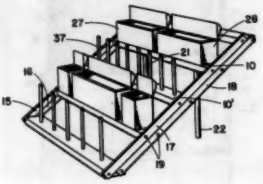
A former for simplifying the making of pleated articles, the former being a strip of plastics material creased to form and hold pleats in position.

3,712,521

MATERIAL-HOLDING DEVICE

Roy E. Tanner, 4810 Second Avenue, Moline, Ill.

Filed Jan. 6, 1971, Ser. No. 104,436
Int. Cl. A41h *31/00*
U.S. Cl. 223—107 8 Claims



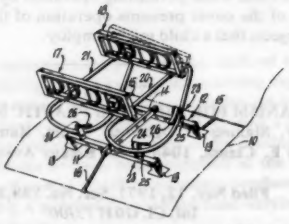
A material-holding device composed of a plurality of vetically-spaced horizontal shelves that are connected at opposite transversely-spaced ends by front and rear parallel links so that the shelves may swing from direct vertically aligned positions with respect to one another to fore-and-aft offset positions with respect to one another. Supported on one of the upper shelves are a pair of depending legs or supports that have lower ends that engage a table top or other surface so as to support the entire device when the shelves are in their fore-and-aft offset positions. The legs or supports are fixed to an upper shelf and are received in notches opening rearwardly in the shelves beneath the upper one. The containers mounted on the shelves have lids that swing about on a transverse horizontal axis and are forced into and are retained in their closed positions when the shelves are moved into their vertically aligned positions.

3,712,522

SKI-MOUNTING RACK MEANS

Robert Penniman, Burlington, Vt., assignor to Barreca Products Co., Subsidiary of Shelburne Industries, Inc., Shelburne, Vt.

Filed Sept. 23, 1971, Ser. No. 182,965
Int. Cl. B60r *9/04*
U.S. Cl. 224—29 R 10 Claims



The invention contemplates ski-mounting means in which the plane of support of the skis can be selectively adjustably elevated, within a wide range of elevation angles. Base-frame structure is secured to a vehicle-body part, in order to provide a reference position for four bearing members, located at corners of a rectangle. A slide-frame structure includes, in addition to conventional ski-rack devices, a pair of spaced parallel

generally arcuate support rails, each of which derives guided support, longitudinally of the rails, in a different two of the bearing members. Clamp means secures a selected angular adjustment of the slide rails to the bearing members.

3,712,523

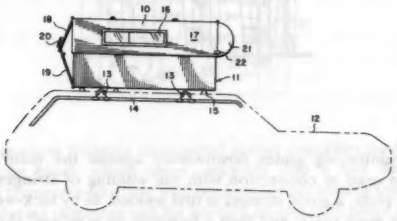
LUGGAGE CARRIER AND CAMPER SLEEPER

Clifford Clyde Coffman, 6923 Overlook Drive, Dallas, Tex.

Filed June 8, 1970, Ser. No. 44,240

Int. Cl. B60r *9/04*

U.S. Cl. 224—42.1 E **4 Claims**



A vertically expansible luggage carrier and camper sleeper for mounting on the top of a motor vehicle and having means for conveniently suspending the assembly from overhead supports in a garage or carport. The invention is further characterized by electrically operated pivot arms for vertically expanding and contracting the carrier-sleeper.

3,712,524

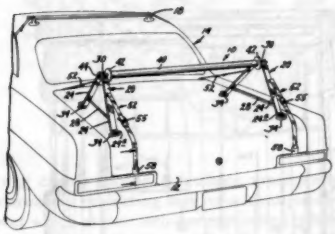
BOAT LOADER FOR AUTOMOBILES

Russell K. Ames, Sr., 3205 Gilbert Street, Duluth, Minn.

Filed March 19, 1971, Ser. No. 126,183

Int. Cl. B60r *9/04*

U.S. Cl. 224—42.1 H **4 Claims**



Apparatus for use in loading a boat onto an automobile roof-top carrier. The loader apparatus is mounted on an automobile deck portion (e.g. a trunk lid) and includes a transverse roller member rotatably supported by vertical legs removably attached to the trunk lid. In loading the boat, a front portion thereof is raised onto the roller member and the boat is then slid upwardly and forwardly on the roller until its weight is properly distributed on the roof-top carrier.

3,712,525

SUIT BAG HANDLE

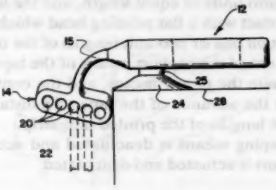
Duard E. McFarland, 1634 Culen, Wichita, Kans.

Filed May 18, 1971, Ser. No. 144,433

Int. Cl. A45c ; B65d *71/00*

U.S. Cl. 224—45 T **8 Claims**

A handle device for supporting a plurality of conventional wire hangers used to carry clothes in a suit bag; including a hinge joint and suction cups on the side thereof so that the suit



bag can be temporarily hung on any vertical or horizontal smooth surface.

3,712,526

DEVICE FOR STORING A TRANSPORTED WEFT THREAD

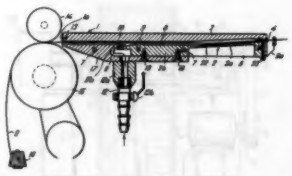
Alois Hanousek, Vazany, and Oldrich Kase, Brno, both of Czechoslovakia, assignors to Elitex, Zavody Textilniko Strojirenstvi, Generalni Reditelstvi, Liberec, Czechoslovakia

Filed Sept. 16, 1971, Ser. No. 176,395

Claims priority, application Czechoslovakia, Sept. 18, 1970, 6381/70

Int. Cl. B65h *51/16*

U.S. Cl. 226—97 **15 Claims**



A weft thread is fed by transporting rollers into a narrow gap into which hair is blown so that the weft thread is moved toward the outlet of the gap over an air permeable plate which causes a fluttering movement of the weft thread so that transverse and open zigzag loops of the weft thread are formed in the gap adjacent the outlet constituting a stored length of weft thread which can be withdrawn through the outlet for picking the weft thread through a warp shed.

3,712,527

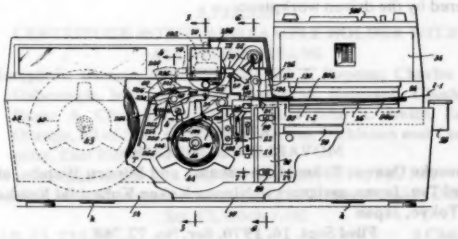
METHOD AND APPARATUS FOR HANDLING TAPE

Harry E. Luperti, Wilton; Robert R. Reid, Easton, both of Conn., and Anthony Waber, Long Island City, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 24, 1970, Ser. No. 66,350

Int. Cl. B65h *17/36*

U.S. Cl. 226—136 **7 Claims**



A tape is advanced by power means and the extent of advance of the tape is controlled by preset means actuated by the travel of the tape.

When used in conjunction with a printer the tape comprises a print-receiving strip divided by lines of tear, such as perforated lines, into units of equal length, and the leading end is raised into contact with a flat printing head which may be employed to print on one or two unit lengths of the tape strip; the return movement of the support means of the tape strip is employed to actuate the power means, and the control means is preset to limit the advance of the tape to a distance equal to one or two unit lengths of the printed tape strip.

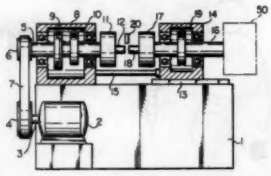
A tape clamping means is deactuated and actuated as the tape drive means is actuated and deactuated.

3,712,528

FRICTION WELDING APPARATUS HAVING MEANS FOR CONTINUOUSLY REGULATING HEAT GENERATED DURING WELDING OPERATION

Nobuo Takagi, and Rikuo Kuroyanagi, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya-shi, Japan

Filed April 30, 1970, Ser. No. 33,292
Claims priority, application Japan, May 12, 1969, 44/36378
Int. Cl. B23k *27/00*
U.S. Cl. 228—2 **12 Claims**



Friction welding apparatus for frictionally welding together two workpieces comprises a driving spindle for rotationally driving one workpiece and a driven spindle slidable towards the driving spindle for moving the other workpiece into frictional engagement with the rotating workpiece which in turn rotationally drives both the other workpiece and the driven spindle. Means are provided for continuously regulating the amount of rotational resistance offered by the driven workpiece to accordingly control the quantity of heat generated during the frictional welding operation and such comprises a rotary pump rotationally driven by the driven spindle to pressurize hydraulic liquid in an hydraulic circuit and as the pump works against the hydraulic liquid to pressurize same, the pump exerts a countertorque on the driven spindle opposing rotation of the driven spindle. An adjustably settable relief valve is connected in the hydraulic circuit and the setting on the relief valve determines the magnitude of the countertorque and therefore the degree of resistance to rotation offered by the driven workpiece.

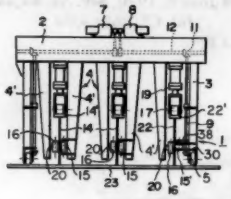
3,712,529

MOVABLE WELDING JIG

Naosuke Ozawa; Takaaki Kawakami, and Minoru Watabe, all of Tsu, Japan, assignors to Nippon Kokan Kubashiki Kaisha, Tokyo, Japan

Filed Sept. 16, 1970, Ser. No. 72,768
Int. Cl. B23k *19/00*
U.S. Cl. 228—44 **10 Claims**

A movable welding jig for welding upright reinforcing plates to a main plate. The jig has a pair of spaced wheel structures and posts extending upwardly therefrom and carrying an upper supporting structure from which a plurality of holding assemblies depend for holding in upright positions reinforcing plates to be welded to a main plate while being freely movable longitudinally along the reinforcing plates. The upper supporting structure carries a plurality of pressing units for pressing



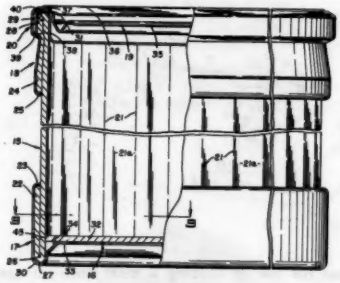
the reinforcing plates downwardly against the main plate. When used in connection with the welding of stringers to a main plate, a guide stringer is first welded, as by tack-welding, to the main plate, and then a movable jig is moved along the guide stringer to be guided thereby while holding additional stringers at predetermined positions with respect to the guide stringer.

3,712,530

DRUM-LIKE CONTAINER SET UP FROM A FOLDED FLAT OF SHEET MATERIAL

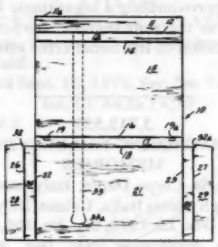
Thomas Croley, Worthington, Ohio, assignor to Corco, Inc., Columbus, Ohio

Filed Feb. 2, 1971, Ser. No. 111,946
Int. Cl. B65d *3/00*
U.S. Cl. 229—4.5 **19 Claims**



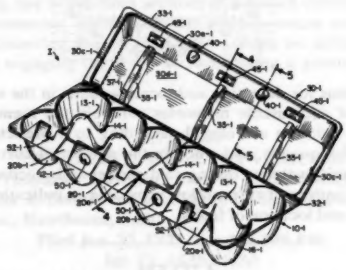
A drum-like container set up from a flat blank of sheet material which is scored to provide a plurality of vertically disposed panels connected together at scored vertical fold lines, with the panels bent relatively at such score lines to provide a drum-like structure. Panels at the respective ends of the blank laterally overlap and are secured together. The blank is folded flat about two of the vertical fold lines to provide superimposed sections, each section consisting of a plurality of connected vertical panels. This folded and collapsed flat can be set up for use by expanding it into polygonal tubular form with upper and lower open ends. These respective ends receive substantially rigid rings, each of which may be a part of an end closure or separate therefrom, which interlock therewith in such a manner as to impart to and to maintain the drum-like form of the expanded structure.

3,712,531
MAILING FOLDER
Richard J. McCall, 1515 Sedgwick Street, Chicago, Ill.
Filed Sept. 24, 1971, Ser. No. 183,460
Int. Cl. B65d 5/02, 65/100, 85/100
U.S. Cl. 229—40 7 Claims



A one-piece foldable corrugated mailer container having a one-piece blank which upon assembly into a box defines locked triangular-like side wall pockets for protecting the side edges during shipment and for holding an object in place away from the peripheral side edges of the folder.

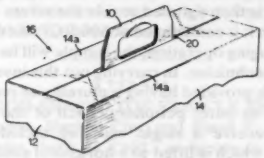
3,712,532
EGG CARTON
John D. Alroy, Union City, N.J., assignor to Borden Inc., New York, N.Y.
Filed Dec. 7, 1970, Ser. No. 95,427
Int. Cl. B65d 85/30
U.S. Cl. 229—44 R 11 Claims



An egg carton having a latching arrangement which includes inwardly projecting lugs on a front panel of the carton top cover which extend into corresponding holes on a latching flap attached to the carton tray. Reinforcing ribs extend across the carton top joining its front and rear panels to prevent spreading of the front panel. Depressions also are formed in the front panel of the carton top into which corresponding stacking lugs of another panel can fit. Two types of cartons are provided with differently located lugs, holes on the latching flap and reinforcing ribs so that the cartons can be stacked to occupy a smaller volume.

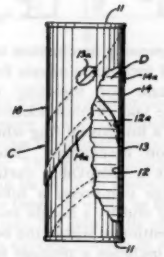
3,712,533
TEAR TOP OPENING CARTON
William R. Skillen, London, Ontario, Canada, assignor to Somerville Industries Limited, London, Ontario, Canada
Filed Jan. 29, 1971, Ser. No. 110,948
Claims priority, application Canada, Aug. 25, 1970, 091699
Int. Cl. B65d 5/54
U.S. Cl. 229—51 TC 4 Claims

A top-opening paperboard carton having a top wall formed of overlapped end wall and side wall flaps, the latter overlying the former and having oblique lines of weakness arranged parallel to and above angled side edge portions on the end wall



flaps, and finger entry points in the top wall whereby the end wall flaps may be engaged by the fingers and pulled upwardly to tear the side wall flaps along the lines of weakness.

3,712,534
PRESSURIZED DOUGH CONTAINER
Wilbur G. Fienup, St. Louis, Mo., and James R. Henderson, Louisville, Ky., assignors to Boise Cascade Corporation, Boise, Idaho
Continuation of Ser. No. 552,804, May 25, 1966. This application April 21, 1969, Ser. No. 818,019
Int. Cl. B65d 17/00, 3/26
U.S. Cl. 229—51 BP 3 Claims

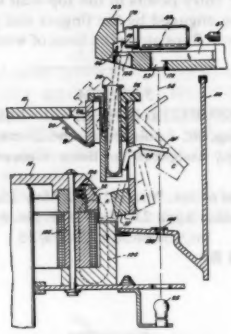


Without limitation on the scope of the claims, this disclosure embodies a container of spirally wound laminated construction for holding pressurized dough products such as preleavened dough and the like wherein the laminations of the container are permanently adhered together in a manner to provide sufficient body wall stiffness to rupture along a predetermined spiral rupture line upon application of only a moderate indenting force against the body wall, a specific embodiment including a dry bond type adhesive for adhering the layers together and the disclosure also embodying the method of opening a pressurized dough package by applying only moderate indenting force against the side wall of the container to rupture the same without peeling off any portion of the laminations.

3,712,535
CENTRIFUGE ROTOR AND SAMPLE HOLDER WITH AGITATING MEANS
Joseph N. Genese, Paterson; Edward J. Rapoza; Charles F. Galanaugh, both of Butler; Harry M. Kennard, Chester; Roger A. Chevalaz, Rockaway, and John A. Smith, East Orange, all of N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.
Division of Ser. No. 32,915, April 29, 1970, Pat. No. 3,605,829. This application Sept. 2, 1971, Ser. No. 177,305
Int. Cl. B04b 1/00
U.S. Cl. 233—3 3 Claims

An apparatus for automatically performing a series of operations on a blood sample contained in a vial. For example, in performing the Coombs antiglobulin test, the apparatus is programed to initially inject saline into the vial, to centrifuge

the vial at approximately 1,300 RCF, and then to decant the saline from the vial leaving a "button" of blood cells in the vial. The above sequence is repeated three times, and then a predetermined amount of Coombs serum is injected into the vial. The vial is then agitated to mix the serum with the blood cells, and then it is centrifuged at 500 RCF. At the termination of the centrifuging operation, the sample will be ready for final analysis by a technician. In carrying out this invention, a circular turntable is provided having a plurality of receptacles positioned about its outer periphery. Each of the receptacles is adapted to receive a single vial and includes a pivotally mounted flag which is lifted to a horizontal position whenever a vial is present. An electrical motor is provided to rotate the



turntable, and a dispensing mechanism overlies the periphery of the turntable and includes a nozzle for injecting the saline as well as a nozzle for injecting the Coombs serum downwardly into the vial. A photoelectric mechanism is provided for detecting a horizontal flag which then actuates the appropriate injection mechanism. The Coombs injecting mechanism includes a removable cartridge containing the serum. The cartridge comprises a tubular barrel which is closed at its forward end by a nozzle and at its rear end by a cylindrical piston positioned within the bore of the barrel. The mechanism further includes a plunger for driving the piston into the bore of the barrel to dispense the liquid from the forward nozzle.

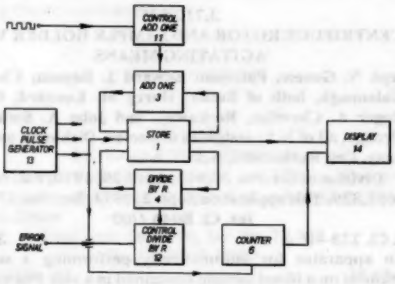
ERRATUM

For Class 235—152 see:
Patent No. 3,713,026

3,712,536
MEAN-RATE INDICATING APPARATUS

John Michael Griffiths, Hillingdon, England, assignor to The Post Office, London, England

Filed March 23, 1971, Ser. No. 118,042
Claims priority, application Great Britain, March 12, 1970, 11,961/70
Int. Cl. G06f *7/38*
U.S. Cl. 235—152 **9 Claims**

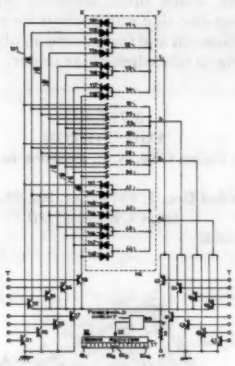


A mean-rate indicator comprises a pulse source to add to the total stored in a recirculating shift register store at a constant rate. At each occurrence of an event-indicating signal the total is reduced to a fixed fraction (¾) of its instantaneous value, the fraction being obtained by serial arithmetic addition of shifted outputs of the register. The total is shown to be a measure of the mean-rate of occurrence of the event-indicating signal and can usefully be displayed as a logarithmic output. The logarithmic output is obtained by use of a counter having a count approximating a logarithmic function clocked at the same rate as the shift register. Particular reference is made to the indication of fractional error rate in digital transmission systems.

3,712,537
CIRCUIT FOR DIAGNOSING FAILURES IN ELECTRONIC MEMORIES

Enrico Carita, Turin Corso Dante, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Dec. 22, 1970, Ser. No. 100,635
Claims priority, application Italy, Dec. 30, 1969, 26421 A/69
Int. Cl. G11c *29/00*
U.S. Cl. 235—153 **10 Claims**

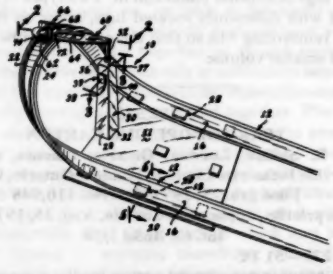


Apparatus for detecting and locating faults in the selection circuits of addressable memories, wherein the memory line selection switches are closed according to a predetermined order and sequence, and wherein the pattern of current flow through said switches during said sequence is recorded, the recorded pattern of current flow providing an indication of the presence and location of faults.

3,712,538
TOY VEHICLE TRACK SUPPORT STRUCTURE

Stanley R. Starr, Hermosa Beach, and Russell C. Edmisson, Manhattan Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 2, 1971, Ser. No. 111,918
Int. Cl. A63h *19/36*
U.S. Cl. 238—10 E **11 Claims**



A support structure including a track connector for distorting the track of a toy vehicle to make the vehicle perform

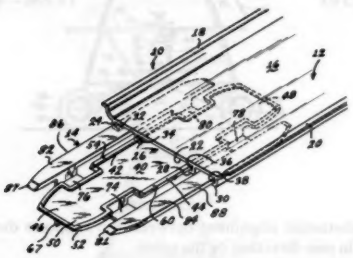
stunts. The connector grips the bottom portion of the track and holds the track in an inverted or upside down position. The connector is vertically adjustable as well as rotatable relative a reference base so as to allow manipulation by an operator of the toy vehicle track system.

3,712,539

TRACK SYSTEM FOR TOY VEHICLE

William A. Staats, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Sept. 18, 1970, Ser. No. 73,290
Int. Cl. A63h *19/30*
U.S. Cl. 238—10 E 7 Claims



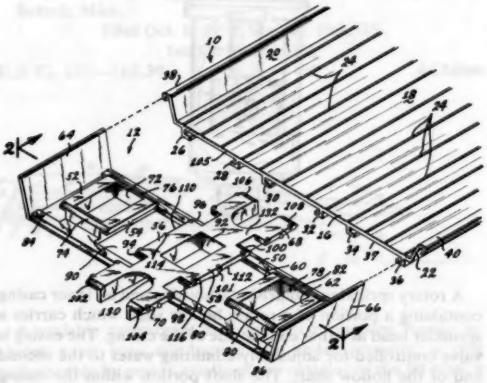
A track system for toy vehicles having a three sectioned track connector for creating and maintaining alignment of adjacent track sections. To provide improved alignment, greater track section strength and stiffness, and to increase the frictional connection between track sections, each track section has four depending flanges which cooperate with the track connector, the inner two flanges for receiving the central section of the track connector and the outer two flanges each receiving one of the outer sections of the track connector. The track connector additionally has protuberances causing the track connector central section to assume an arcuate shape thereby engaging the track sections along a greater surface area.

3,712,540

TRACK SYSTEM FOR TOY VEHICLES

Toshio Yamasaki, Gardena; John S. Cook, Sunnyvale, and William A. Staats, Torrance, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 22, 1971, Ser. No. 108,840
Int. Cl. A63h *19/30*
U.S. Cl. 238—10 E 9 Claims



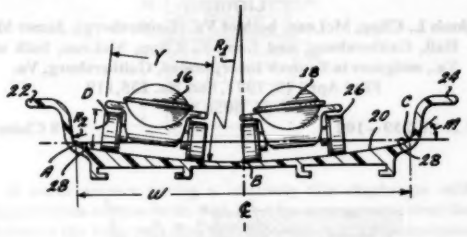
A track system comprising a track section and track section connector where the track section is substantially wider than the vehicles which move along its running surface in a racing manner. The connector is partially divided into three parts and includes alignment flanges so as to align and join abutting track sections; alignment includes maintaining a substantially level running surface and smooth adjoining track section guide flanges which act as retaining walls.

3,712,541

TROUGH-SHAPED TOY VEHICLE TRACK

Dennis H. Merino, Harbor City, and Floyd E. Schlau, Palos Verdes Estates, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 20, 1970, Ser. No. 65,370
Int. Cl. A63h *19/30*
U.S. Cl. 238—10 E 2 Claims



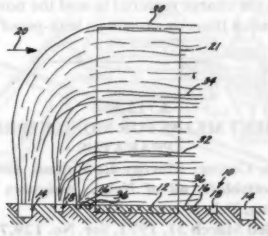
A track for use with self-powered or coasting-type toy vehicles which allows passing of slower vehicles by faster ones by encouraging the vehicles to wander gradually from one side of the track to the other. The track is concave, with a radius of curvature greater than its width to encourage vehicle wandering, but less than five times its width to reduce the likelihood of vehicles crashing into the side walls of the track. The side walls meet the gently curving portion in a radius of curvature which is more than one-fiftieth the width of the track to turn vehicles back towards the center of the track with a minimum of scraping.

3,712,542

FOG DISPERSAL SYSTEM

Frank C. Price, Jr., Santa Ana, Calif., assignor to Ultrasystems, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 47,422, June 18, 1970, abandoned. This application March 15, 1971, Ser. No. 124,238
Int. Cl. E01h *13/00*
U.S. Cl. 239—2 R 9 Claims



A fog dispersal system for an aircraft runway or the like and including an arrangement of heaters of various intensities dis-

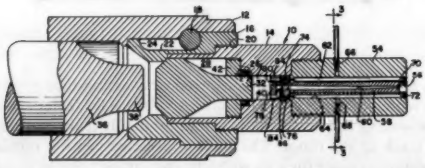
tributed along the sides of the runway, the heaters producing plumes of heated air which rise to different levels according to their intensity and expand and merge over the runway in adjoining layered relation. The plumes from the larger heaters rise and diffuse to a higher altitude compared to the plumes of heated air from the smaller heaters. The resulting generally horizontally oriented layered plumes of heated air over the runway heat the air to an extent sufficient to clear it of fog droplets. Automatic means are provided to select the appropriate heaters and the intensity of their burning to suit any one of several combinations of wind velocity and direction. One embodiment provides for the addition of fog dispersal particles to each heater effluent so that the particles rise and diffuse with the warm plume.

3,712,543

APPARATUS FOR GENERATING PULSED JETS OF LIQUID

qlouis L. Clipp, McLean, both of Va. (Gaithrsburg); James M. Hall, Gaithersburg, and Louis L. Clipp, McLean, both of Va., assignors to Exotech Incorporated, Gaithersburg, Va.

Filed April 19, 1971, Ser. No. 135,119
Int. Cl. B05b *3/14*
U.S. Cl. 239—102 **8 Claims**



Apparatus for generating pulsed jets of liquid or gel charge material. An expulsion barrel has a charge inlet, a charge storage area, a charge outlet and a valve zone coupling the charge storage area with the charge inlet and the charge outlet. A valve within the valve zone moves under pressure from the charge inlet to a position in which charge material is permitted to pass from the inlet to the charge storage area, while being blocked from the charge outlet, and under pressure from the charge storage area due to action of a piston to a position in which charge material is permitted to pass from the storage area to the charge outlet, while being blocked from the charge inlet. In this manner, the expulsion barrel is dry between jets which provides for a higher pressure jet. A improved seal prevents charge material from escaping around the piston. The seal includes a non-resilient portion interfacing with the piston during piston movement and a resilient portion placed between this non-resilient portion and the surrounding housing and which is compressed due to applied pressure from the charge material to seal the non-resilient portion and the piston thereby assuring a leak-proof seal.

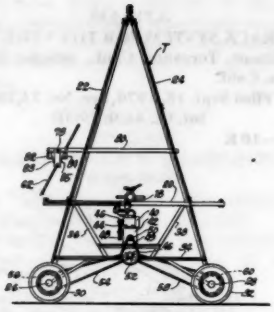
3,712,544

ALIGNMENT MEANS FOR MOBILE IRRIGATION APPARATUS

Max H. Ririe, Gering; Murray C. Roland, and Rich Olson, both of Scottsbluff, all of Nebr., assignors to Lockwood Corp., Gering, Nebr.

Filed March 31, 1971, Ser. No. 129,793
Int. Cl. B05b *3/00*
U.S. Cl. 239—177 **3 Claims**

A mobile irrigation apparatus formed of an elongate water distributing pipe having spaced sprinkling outlets and a plurality of laterally spaced apart mobile supports for movement of the distributing pipe over the land with means for maintaining substantial alignment between the supports during movement in one direction or the other.

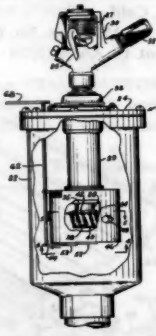


3,712,545

ROTARY SPRINKLER INCLUDING MEANS FOR VARYING ROTATION RATE DURING EACH CYCLE OF ROTATION

Webster Felix, One Casa Court, Central Islip, N.Y.

Filed April 30, 1971, Ser. No. 139,010
Int. Cl. B05b *3/04*
U.S. Cl. 239—233 **11 Claims**



A rotary sprinkler comprising a housing and an inner casing containing a portion of a rotary hollow shaft which carries a sprinkler head at a first end outside of the casing. The casing is valve controlled for adjustably admitting water to the second end of the hollow shaft. The shaft portion within the casing carries a disk with a plurality of vanes upon which a jet of water may impinge for speeding up rotation of the shaft during each cycle of rotation. The vanes may be removably mounted

for changing numbers and spacing of the vanes on the disk or may be turnably mounted about a vertical axis for alternately disposing them in line with the jet of water and out of line with respect to the water jet.

3,712,546

ROCKET ENGINE EXHAUST NOZZLE WITH BOUNDARY LAYER CONTROL

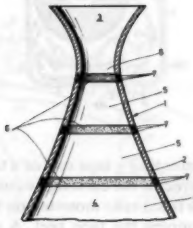
Michael Kaufmann, Neubiberg, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munchen, Germany

Filed May 3, 1971, Ser. No. 139,397

Claims priority, application Germany, May 8, 1970, P 20 22 517.6

Int. Cl. B63h *11/00*

U.S. Cl. 239—265.11 10 Claims



An exhaust nozzle for rocket engines. A series of relief openings are provided through the wall of the exhaust nozzle, said openings being preferably arranged in circumferentially complete but axially spaced groupings. The relief openings may be provided either by making axially successive sections of the exhaust nozzle from porous material or same may be provided by machining or similar methods. The successive bands of openings tend to bleed off sufficient exhaust gas to prevent the development of turbulent flow and thereby maintain such flow in a laminar condition. This reduces the frictional energy losses otherwise tending to develop as the exhaust gases flow through the exhaust nozzle for a given expansion ratio and length thereof.

3,712,547

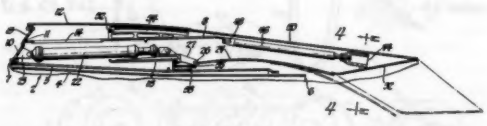
VARIABLE CONVERGENT-DIVERGENT JET PROPULSION NOZZLE

Charles H. Smale, and Esten W. Spears, Jr., both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1971, Ser. No. 185,525

Int. Cl. B64c *15/08*

U.S. Cl. 239—265.39 4 Claims



A variable convergent-divergent jet propulsion nozzle includes a jet pipe conducting gas under pressure, a ring reciprocable by power axially of the exterior of the jet pipe, a ring of flaps defining a converging nozzle section pivoted on the reciprocable ring, and a ring of flaps defining the diverging downstream portion of the nozzle pivoted to the convergent flaps near the downstream end of the convergent flaps. When the flaps are moved rearwardly by power, a cam and roller type girdle closes in the divergent portion of the nozzle, and with it the convergent portion. A ring of fairing flaps each fixed onto the exterior of one of the divergent flaps creates a boattail fairing. These cooperate with tracks which guide the assembly of boattail and divergent flaps as it is projected or retracted.

3,712,548

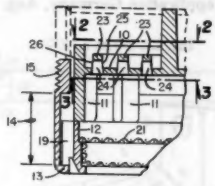
WATER AERATOR

Elie P. Aghnides, 795 Fifth Avenue, New York, N.Y.

Filed Aug. 20, 1970, Ser. No. 50,948

Int. Cl. E03c *1/08*

U.S. Cl. 239—428.5 12 Claims



A water aerator having a relatively thin diaphragm with square cross-section holes with a bridge arrangement over the holes on the upstream side to form either one water entrance or two water entrances to each hole. In the case of the bridge arrangement to form two water entrances, the size of one entrace to any hole may be different from that of the other entrance to permit the issuing turbulent jet of water to diverge or converge. The structure contains a casing having an annular enlargement at the downstream end which is unindented.

3,712,549

GRINDING RAW MATERIALS IN THE MANUFACTURE OF CEMENT

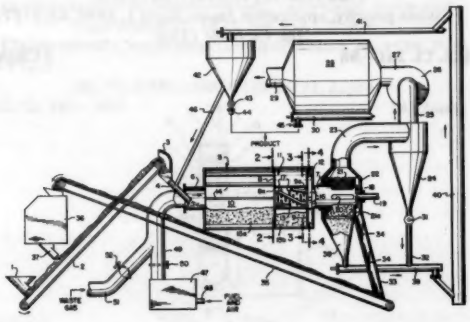
Jorgen Olav Cleemann, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Dec. 23, 1970, Ser. No. 101,006

Claims priority, application Great Britain, Jan. 6, 1970, 644/70

Int. Cl. B02c *17/06*

U.S. Cl. 241—19 14 Claims



A method and apparatus for grinding raw materials having a maximum particle size of for example about 250 mm. to a final product with a maximum size of, say, 0.2 mm. in a closed cir-

cuit grinding system comprising only one tube mill having primary and secondary grinding chambers.

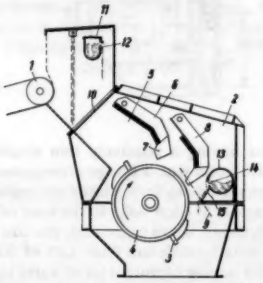
ERRATUM

For Class 241—27 see:
Patent No. 3,712,353

3,712,550
APPARATUS FOR PROCESSING EFFLUENT SLUDGE

Eugen von Conrad; Kurt Rosner, and Ludwig Meyer, all of Munster/Westf., Germany, assignors to Hazemag GmbH, Munster, Germany

Division of Ser. No. 851,970, Aug. 21, 1969, Pat. No. 3,659,792. This application April 19, 1971, Ser. No. 135,106
Claims priority, application Germany, Aug. 23, 1968, P 17 84 605.8
Int. Cl. B02c *13/09*
U.S. Cl. 241—41 8 Claims

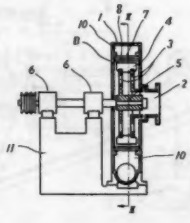


Effluent sludge obtained upon clarification of waste effluent is admixed with solid refuse either before or subsequent to reduction of the solid refuse to particulate state in an impact grinder.

3,712,551
DEVICE FOR GRINDING SYNTHETIC RESIN OR LIKE HAVING LOW MELTING TEMPERATURE INTO POWDER

Masuo Hosokawa, Toyonaka-shi, Osaka; Tohei Yokoyama, Honmachi, Osaka; Teruaki Suzuki, Kadoma-shi, Osaka; Yoshiaki Aki, Minami-nakafuri, Osaka, and Masahiko Tokui, Higashiyama, Osaka, all of Japan, assignors to Kabushiki Kaisha Hasokawa Funtaikogaku Kenkyusho, Minato-ku, Osaka, Japan

Filed Sept. 1, 1970, Ser. No. 68,645
Claims priority, application Japan, April 1, 1970, 45/27571
Int. Cl. B02c *13/09*
U.S. Cl. 241—88 3 Claims

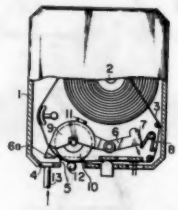


Apparatus for pulverizing materials having low melting points wherein the temperature of the material is maintained just below the melting and softening temperatures by controlling the flow of material into the pulverizing rotor which is surrounded by a liner and coordinating the flow of material with the speed of the rotor and the temperature of the air carrying the material.

3,712,552
STOPPER FOR A TAPE REEL OF A TAPE CARTRIDGE

Eiihi Wada, 174, Aigashi-kubo-machi, Nishi-ku, Yokohama-shi, Kanagawa, Japan

Filed June 5, 1970, Ser. No. 43,922
Claims priority, application Japan, June 7, 1969, 44/53567
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 A 3 Claims

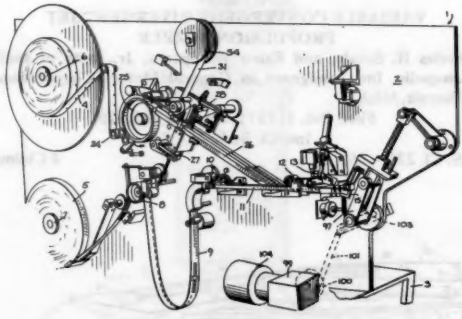


A brake arrangement for a tape reel of a tape cartridge has a lever pivotally secured to the cartridge outside of the tape reel periphery and has a first brake mounted on the reel side of one end thereof for stopping the tape reel. A spring secured adjacent to said lever depresses the lever against the tape reel. A second brake is mounted on the end of the lever and a pinch roller is mounted on the other side of the same end of the lever. This stops the rotation of the tape reel when it is not in the recorder or is not played while set into the tape recorder.

3,712,553
FILM SCROLL WINDING MACHINE

Carl A. Napor, Glen Ridge, and Charles G. Krumm, Wyckoff, both of N.J., assignors to Kahle Engineering Company, Union City, N.J.

Filed March 19, 1971, Ser. No. 126,243
Int. Cl. B65h *19/26*
U.S. Cl. 242—56 R 23 Claims



An improved machine is described for automatically winding scrolls of interwound backing paper and sensitized film and for transferring the wound scrolls to a film cartridge loading or other machine. The machine mounts rolls of perforated sensitized film and backing paper which are fed through stationary converging tracks to a common track along which they pass in abutting relationship to a slotted scroll winding arbor. Automatic controls count the film and paper perforations to

check the position and lengths of strips cut from the rolls. The output of the machine is increased by utilizing the scroll winding movement of the arbor for one scroll to simultaneously advance the paper strip for the next scroll.

3,712,554

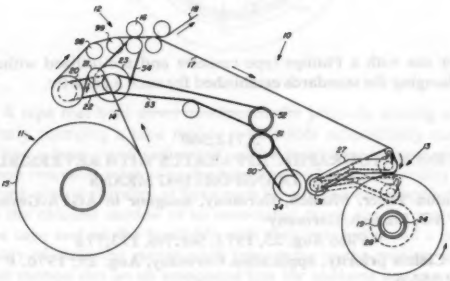
APPARATUS FOR WINDING A PLURALITY OF WEB ROLLS OF VARIOUS WIDTHS AND RADII AT A SINGLE WINDING STATION

Raymond Lorenzini, and Helmuth J. Klinkert, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,511

Int. Cl. B65h *35/02*

U.S. Cl. 242—56.2 **6 Claims**



In combination with a slitting apparatus for slitting a stock web into a plurality of narrow strips, there is provided an apparatus for winding the strips into rolls of respective widths and respective radii at a single winding station. The apparatus includes a plurality of wind arms each having a builder roller for driving a core upon which a web is to be wound, and for maintaining web tension to facilitate the web slitting operation. The drive for the builder roller overdrives the builder roller, and includes a slip clutch which, by slipping, enables the builder roller to assume a peripheral speed which is the same as the speed of the web. The overdrive and the degree of coupling in the clutch are utilized to determine web tension. To provide improved tension control, the builder roller is driven from the same source that controls the speed of the web so that the speed profile of the builder roller is similar to that of the web. A driven air roller is mounted on the arm for positively guiding the web toward the builder roller.

3,712,555

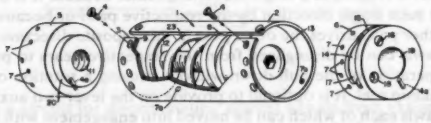
APPARATUS FOR CONTROLLING THE TENSION OF WEBS

Raymond W. O'Brien, Cedar Road, Boxford, Mass.

Filed Feb. 8, 1971, Ser. No. 113,538

Int. Cl. B65h *75/24*

U.S. Cl. 242—72 **4 Claims**



A mandrel for regulating the tension on a web being unrolled from a storage roll placed on the mandrel by changing the friction force between the storage roll which rotates relative to the mandrel. The mandrel is radially expandable and comprises a split cylindrical sleeve housing a radially expandable spring. The spring is expanded by means of a rotatable stud adjacent one end of the spring, a stud fixed to the sleeve on the other end of the spring and a screw fixed to the rotatable stud and mating with a spiral bore in the fixed stud. During use, one side of the sleeve adjacent the opening is fixed while the other side of the sleeve adjacent the opening is free.

3,712,556

SINGLE-LINE CLOTHES-LINE

Joseph Bosco, 31 Summer Street, Everett, Mass.

Filed Sept. 23, 1970, Ser. No. 74,752

Int. Cl. D06f *53/02*; **B65h** *75/34*

U.S. Cl. 242—100 **3 Claims**

This invention relates to clothes lines, and more particularly to such lines which may be singly loaded. More specifically to the present invention there is provided a garment hanging device which may permit loading from the inside of the window. To this effect there are provided a pair of spools or rollers to which the hanging line is wound; one roller in the pair is mounted to a pole in the yard, while the other roller is mounted to a hanging arm which is held to swing on a bracket secured to the window-sill. The arm in question is swung into the window when hanging the garments to the line, and is swung out of it upon completion of the hanging operation. The clothes line is of an entirely new construction never before encountered. Instead of the conventional yarn or cord the new line is formed of a flat, thin, stiff ribbon-like material which at various places may be provided with serrated cut-outs, and openings of different sizes. Into these serrated cut-outs and in the openings may be hooked the clothes to be hung.

3,712,557

CASSETTE AND SUPPLY REEL FOR USE IN CASSETTE-LOADED CINEMATOGRAPHIC APPARATUS

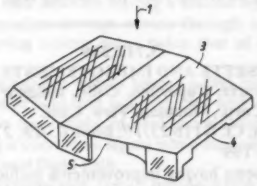
Volkmar Stenzenberger, Unterhaching; Klaus Fuchsle, and Fridolin Hennig, both of Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed March 25, 1971, Ser. No. 127,936

Claims priority, application Germany, March 26, 1970, P 20 14 872.5

Int. Cl. G03b *1/04*; **G11b** *15/32, 23/04*

U.S. Cl. 242—197 **14 Claims**



A cassette for use in cassette-loaded motion picture projectors has a pair of sections one of which carries a separable retaining member which can be used to secure the inner end

of convoluted motion picture film to the hub of a supply reel. The retaining member is glued to or integral with the respective section and can be broken off by the user to be inserted into a socket of the supply reel in order to clamp the inner end of the film against the inner side of the hub. The position of the retaining member on the one section can be such that a supply reel can be inserted into the housing only when the retaining member is detached. The retaining member does not interfere with insertion of an empty supply reel.

3,712,558

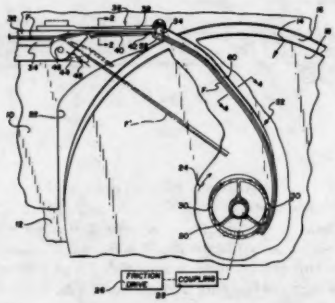
TAKE-UP DEVICE FOR A STRIP OF WEB MATERIAL

Robert B. Johnson, and Craig E. Smith, both of York, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed March 15, 1971, Ser. No. 124,074

Int. Cl. G03b *1/04;* **G11b** *15/32*

U.S. Cl. 242—195 **10 Claims**



A take-up device for a strip of web material includes a friction driven take-up reel having a pair of spaced flanges and a hub rotatably mounted on a housing. A plurality of teeth extend radially from the hub for engaging the leading end portion of a strip of web material. After leaving the open end of a threading channel having an open end spaced from the hub, the leading end portion of the strip of web material enters a link for guiding the strip to an arm which in turn directs the strip between the reel flanges to the hub. The strip is pulled away from the arm and out of the web guide link by tension applied thereto by the rotating hub to define a new path for the strip from the open end of the threading channel to the hub. A snubber positioned adjacent the open end of the threading channel has a first position for guiding the leading end portion of an advancing strip of web material from the open end of the threading channel to the web guide link and a second position spaced transversely from the first position in a direction perpendicular to the web material's plane. The snubber is spring biased toward its first position and is moved toward its second position by web tension. When the strip is being rewound from the take-up reel, the snubber is effective to accommodate instantaneous differences in the velocity of the strip in the threading channel and the velocity of the web material being unwound from the take-up reel.

3,712,559

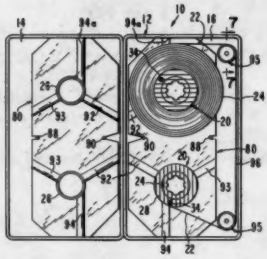
TAPE CASSETTE AND IMPROVEMENTS THEREFOR

Vern R. Schwartz, Cupertino, Calif., assignor to Information Terminals Corp., Mountain View, Calif.

Int. Cl. G11b *23/10;* **B65h** *05/28, 27/00*

U.S. Cl. 242—199 **9 Claims**

A tape cassette having improvements including a hub having means for securely adapting a tape leader thereto, a slip sheet for assuring uniformity of the winding of a tape pack on a hub, an idler post having anti-friction means on its outer periphery, means for distinguishing a pair of tape hubs in a tape cassette, and identification means on the cassette to provide an interlock structure when the cassette is used with a transport apparatus. The improvements are especially adapted



for use with a Phillips type cassette and are utilized without changing the standards established for such a cassette.

3,712,560

CINEMATOGRAPHIC APPARATUS WITH REVERSIBLE FILM TRANSPORTING MEANS

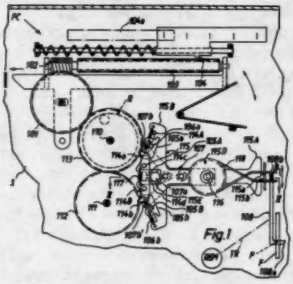
Anton Theer, Munich, Germany, assignor to AGFA-Gevaert AG, Munich, Germany

Filed Aug. 23, 1971, Ser. No. 173,772

Claims priority, application Germany, Aug. 29, 1970, P 20 42 956.6

Int. Cl. B11b *15/32;* **G03b** *1/04*

.S. Cl. 242—205 **12 Claims**

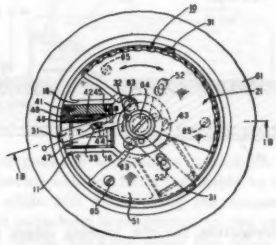


The takeup reel of a motion picture camera is rotatable by the claw pull-down through the intermediary of two meshing gears one of which directly drives the reel. During stepwise forward transport of the film, the claw pull-down transmits recurrent alternating pivotal movements in opposite directions to a lever which carries two spring-biased main pawls each normally engaging one of the gears so that the one reel is rotated in a single direction, either because it is driven in such single direction by the respective pawl or because the other pawl drives the other gear in the opposite direction. The pawls can be disengaged from the respective gears to permit operation of the pull-down without causing a rotation of the takeup reel. It is optional to provide on the lever two auxiliary pawls each of which can be moved into engagement with a different gear when the main pawls are disengaged to thus rotate the respective gears in directions counter to those in which the gears are rotated by the main pawls so that the reel can pay out the film when the claw pull-down transports the film rearwardly.

3,712,561
TAPE REEL HOLD DOWN MECHANISM

James Edgar Williams, Hackettstown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed March 16, 1971, Ser. No. 124,712
Int. Cl. B65h *17/02*
U.S. Cl. 242—68.3 5 Claims

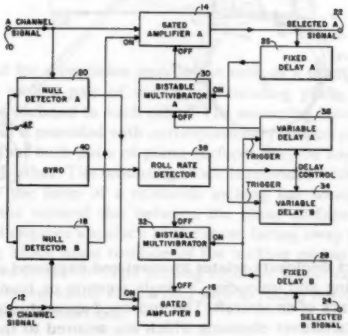


A tape reel hold down mechanism for properly seating and firmly clamping a tape reel to a turntable substantially comprises a base rigidly attached to the turntable, an actuating knob rotatable relative to the base and including a plurality of crank pins, a plurality of links each having one end responsive to the circular motion of an associated crank pin for seating the tape reel on the turntable with their other end and a plurality of clamping means each responsive to the motion of a lost motion slot on an associated link for applying an outward radial clamping force to the inner diameter of the tape reel. In a particular embodiment of the invention, the clamping means includes a thin rubber pad and a preloaded compression spring assembly.

3,712,562
SECTOR GATING CIRCUIT

Frederic C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 19, 1964, Ser. No. 369,055
Int. Cl. F42b *15/02*
U.S. Cl. 244—3.15 5 Claims



In a circuit for discriminating against signals from extraneous targets received by a tracking device in which the planes of direction finding are rotated, such as the seeker of a rolling missile, the combination comprising:

a. a first input terminal for receiving target signals from one channel of a target seeker,

b. a second input terminal for receiving target signals from another channel of said target seeker,

c. roll rate circuit means for producing delayed signals synchronized to the roll of said missile,

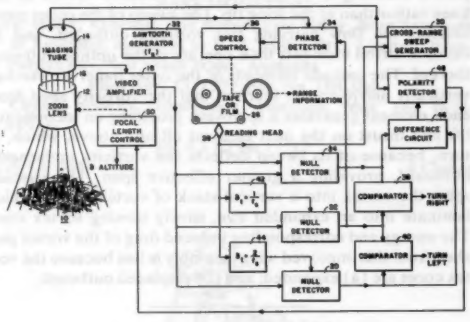
d. first gate circuit means for passing signals received at said first input terminal when signals present at said second input terminal are at a null and being responsive to the delayed signal of said roll rate circuit means for blocking signals received at said first circuit means,

e. second gate circuit means for passing signals received at said second input terminal when signals present at said first input terminal are at a null and being responsive to the delayed signals of said roll rate circuit means for blocking signals received at said second circuit means.

3,712,563
AUTOMATIC PATH FOLLOWER GUIDANCE SYSTEM

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 4, 1963, Ser. No. 328,129
Int. Cl. F42b *15/02*
U.S. Cl. 244—3.17 7 Claims



In an airborne vehicle automatic path follower guidance system, the combination comprising:

a. optical scanning means located in the airborne vehicle for scanning a landscape below said vehicle at a predetermined repetition rate,

b. optical information storage means for storing information peculiar to the terrain of the path over which the vehicle is intended to fly,

c. first, second, and third null detectors,

d. each of said null detectors having a first input coupled to said optical scanning means,

e. said first null detector having a second input coupled directly to said information storage means,

f. said second null detector having a second input coupled to said information storage means through a first delay circuit having a time delay equal one scan of said optical scanning means,

g. said third null detector having a second input coupled to said information storage means through a second delay circuit having a time delay twice that of said first time delay,

h. a first comparator circuit having a first input coupled to the output of said first null detector and a second input coupled to the output of said second null detector for producing a corrective signal when said vehicle moves to the left of said flight path,

i. a second comparator circuit having a first input coupled to the output of said second null detector and a second input coupled to the output of said third null detector for producing a corrective signal when said vehicle moves to the right of said flight path.

3,712,564

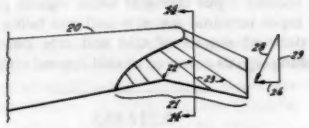
SLOTTED DIFFUSER SYSTEM FOR REDUCING AIRCRAFT INDUCED DRAG

Scott C. Rethorst, 1661 Lombardy Road, Pasadena, Calif.

Continuation-in-part of Ser. No. 792,872, Jan. 21, 1969, abandoned. This application Nov. 13, 1970, Ser. No. 89,415

Int. Cl. B64c 3/00

U.S. Cl. 244—41 6 Claims



A wing assembly for increasing lift and reducing drag is disclosed comprising (1) an inboard conventional primary wing panel, and (2) an outboard secondary wing panel which is aft-swept and comprised of a cascade of airfoil elements. The inboard panel is provided with a constant lift distribution which is dropped sharply at the knee or juncture with the outer panel, shedding a substantially concentrated vortex at the knee rather than at the wing tip. The sweep of the outer panel deflects the flow carrying this vorticity outboard, and its cascade airfoil elements then operate in the upflow outboard thereof. The cascade elements of the outer panel are stacked vertically above to the rear, so that the vorticity shed from each element generates a spanwash providing an incremental lift and thrust on the next element aft and above, which, in turn, because of its sweep deflects the vorticity underneath outboard, providing a greater effective span. The cascade splits the vortex into a vertical stack of vortex sheets, which laminate into an expanded size, slowly turning vortex core. The energy and corresponding induced drag of the vortex pair shed from this improved wing assembly is less because the vortex cores are (a) expanded, and (b) displaced outboard.

3,712,565

BARRIER SYSTEM FOR AIRCRAFT OF DIFFERENT SIZES

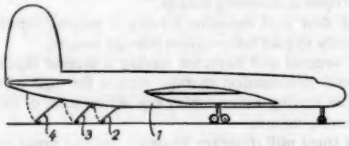
Karl Ove Torgny Walander, Elsa Brandstrom gata 5, Linkoping, Sweden

Filed Jan. 18, 1971, Ser. No. 107,345

Claims priority, application Sweden, Jan. 23, 1970, 80870/1970

Int. Cl. B64c 25/68

U.S. Cl. 244—110 G 3 Claims



An aircraft arrester system of the type in which a hook mounted on an aircraft engages with a wire connected to braking means, said wire being complemented by additional wires, each of the latter wires having a brake or brakes and each of said wires being arranged parallel and sequentially in the direction of aircraft movement to arrest the movement of aircraft of different weights, such aircraft being provided with additional arrester hooks each of which is intended to engage its respective wire to a number dependent upon the weight of an aircraft.

3,712,566

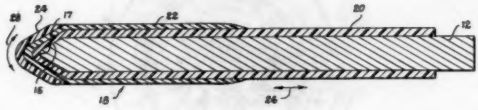
SUPERSONIC VEHICLE CONTROL SURFACE HAVING A THERMALLY PROTECTIVE COATING

Kenneth E. Branen, Nashua, N.H.; George K. Castle, and Charles K. Mullen, both of Chelmsford, Mass., assignors to the United States of America as represented by the Secretary of the Navy

Filed Feb. 25, 1971, Ser. No. 118,715

Int. Cl. B64c 1/38

U.S. Cl. 244—117 A 3 Claims



Thermal protection for the leading edges of supersonic vehicle control fins is provided by a coating of one or more layers of silica cloth impregnated with a phenolic resin and bonded to the control fin. The cloth is tightly woven with 70–80 percent of the fibers extending in the warp direction of the weave and is applied on the fin with the warp fibers extending parallel to the flow along the sides of the fin and perpendicular to the flow at the fin's leading edge stagnation line.

3,712,567

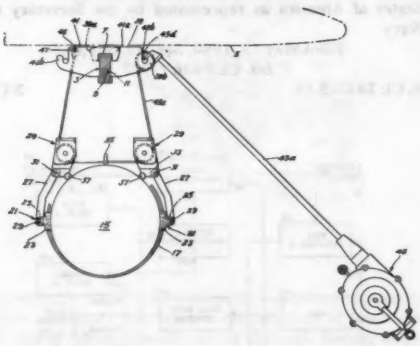
WEAPON HANDLING APPARATUS

Joseph P. Ruggeri, 214 Third Avenue, Cherry Hill, N.J.

Filed March 18, 1971, Ser. No. 125,671

Int. Cl. B64c 1/22

U.S. Cl. 244—137 R 5 Claims



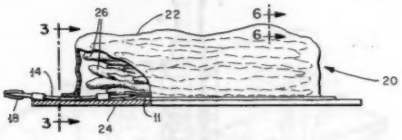
Subject disclosure relates to novel and improved apparatus for loading and unloading a single weapon or bomb on the ejector rack of an aircraft. The improved apparatus includes a pair of cantilever elements which are secured to the ejector rack and extend outwardly from opposite sides thereof, a bomb engaging band which extends around the lower periphery of the bomb, a pair of sheave assemblies which are connected to the band and extend upwardly from opposite sides of the bomb, a power hoist which depends downwardly and outwardly from one cantilever element, and a cable which is secured at one end to the other cantilever element and extends downwardly around one sheave, around the other sheave and upwardly to the hoist.

3,712,568

VACUUMIZED CONTAINER FOR A PARACHUTE

Vito A. Grasso, Franklinville, N.J., and Michael S. Frankel, Cheltenham, Pa., assignors to The Budd Company, Philadelphia, Pa.

Filed March 1, 1971, Ser. No. 119,766
Int. Cl. B64d 17/40
U.S. Cl. 244—148 8 Claims



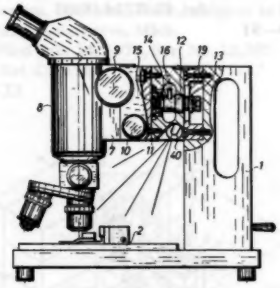
Vacuumized package includes a parachute with a main body. A connector extends from the inside to the outside of the package while still maintaining the vacuum therein. A strap from the parachute is connected to one end of the connector inside of the package while the other end includes means outside of the package adapted to be connected to a strap or harness to be worn by a pilot.

3,712,569

SUPPORTING MOUNT FOR AN INSTRUMENT STAND

Toni Dietrich, Wetzlar, Germany, assignor to Firma Wilhelm Will KG, Nauborn, Germany

Filed Nov. 26, 1969, Ser. No. 880,103
Claims priority, application Germany, Nov. 27, 1968, P 18 11 185.8
Int. Cl. F16m 11/04
U.S. Cl. 248—125 7 Claims



A stand for a precision instrument such as a microscope is provided with a pair of vertically extending plane surfaces which are inclined to each other. The mounting block of the instrument is provided with correspondingly shaped plane surfaces so that both pairs of plane surfaces may be superposed upon each other. The mounting block is provided with locking means in the form of a rotatable locking bar which passes through the vertical slot between the plane surfaces on the stand and engages a surface of the stand facing away from the mounting block upon rotation of the locking means through an angle of about 90°. The locking member is also capable of axial movement either concurrent with its rotary movement or independently therefrom.

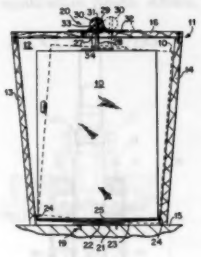
3,712,570

LEVELING DEVICE

Charlie J. Stone, 904 Percywarner Blvd., Nashville, Tenn., and Joseph S. Stone, 6817 Kipling Drive, Holland, Ohio

Filed Nov. 19, 1971, Ser. No. 200,531
Int. Cl. F16m 11/06
U.S. Cl. 248—133 8 Claims

A device for leveling an upright body, such as a refrigerator, upon a bottom supporting surface, such as the floor of a mobile vehicle, including a bearing member on the bottom supporting surface to support the bottom end of the body for universal rocking movement about a vertical axis, and a spher-



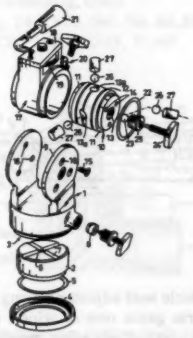
ical knob fixed to the top end of the body and received in a laterally slidable seat resting upon the top surface of an opening in a fixed top support structure.

3,712,571

BASE MOUNTING

Eric Miller, Vaucluse, and Robert Eric Miller, Rose Bay, both of Australia, assignors to R. E. Miller Pty., Limited, Rushcutters Bay, New South Wales, Australia

Filed Nov. 12, 1971, Ser. No. 198,384
Claims priority, application Australia, May 18, 1971, PA4916/71
Int. Cl. F16m 11/12
U.S. Cl. 248—183 4 Claims



A base mounting for an instrument or machine which has to be panned and/or tilted, the mounting incorporating a lock mechanism comprising a plurality of balls acting on brake rods.

3,712,572

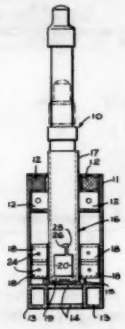
MECHANICAL EXTENSION DEVICES FOR HYDRAULIC OR OTHER PROPS

Karl M. Groetschel, Stolzestrasse 44, Bochum, Germany

Filed May 12, 1970, Ser. No. 36,640
Claims priority, application Great Britain, May 16, 1969, 25,153/69
Int. Cl. E21d 15/14
U.S. Cl. 248—354 R 17 Claims

A stilt for use with a pit prop comprising an outer tubular member which at one end receives an end portion of the prop and which contains either a variable number of spacer pieces or a variable height spacer piece, and the tubular member has an entry at its end remote from the prop to enable spacer pieces to be inserted and removed or the variable height

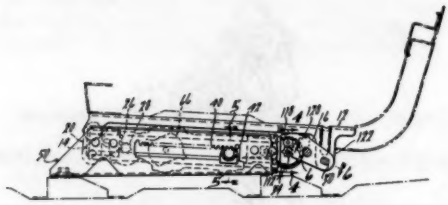
spacer piece adjusted, such stilt being provided either at the lower end or upper end of the prop which may be incorporated in a self-advancing roof support comprising a base, a plurality of such props and a roof-engaging superstructure.



3,712,573
SIX-WAY VEHICLE SEAT ADJUSTER

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Nov. 19, 1970, Ser. No. 90,945
Int. Cl. F16m *11/12*
U.S. Cl. 248—394 **5 Claims**



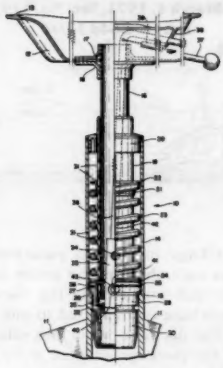
A six-way vehicle seat adjuster having a motor driven worm driving two worm gears one of which is connected through two clutches to vertical adjusting mechanism at each end of the vehicle seat, and the other of which is connected through a clutch to mechanism for adjusting the seat fore and aft.

3,712,574
CHAIR HEIGHT CONTROL

Heinz Rothermel, 604 W. Bloor Street, Apt. 13, Toronto, Ontario, Canada

Filed Dec. 1, 1970, Ser. No. 94,105
Int. Cl. F16m *11/04*
U.S. Cl. 248—409 **6 Claims**

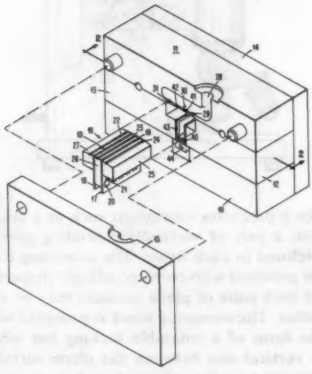
A chair height control having an outer non-rotatable tube fixed to the chair base or legs, an innermost longitudinally telescoping tube supporting the chair seat, and an intermediate locking tube rotatable with respect to the fixed tube, by suitable bearing means incorporated within the fixed tube, and a releasable catch means is provided within the innermost longitudinally extendible tube, which is releasably operable from immediately beneath the seat, and provided for interlocking engagement with a series of recesses in the intermediate tube, whereby the innermost tube can be extended or retracted with respect to the intermediate tube, and fastened in any desired height, and, when fastened in position, both the inner tube and the intermediate tube rotate together in unison with relation to the outer fixed tube.



3,712,575
CAVITY MOLD WITH SELECTIVELY POSITIONED RESILIENT WALL PORTIONS

Ronald Allan Bement, Northglenn, and Augustus Boyd Brown, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 6, 1970, Ser. No. 87,509
Int. Cl. B22d *19/00*
U.S. Cl. 249—91 **3 Claims**



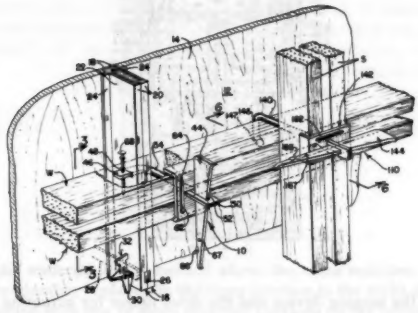
A magnetic recording head is molded by positioning a number of ceramic cards, each of which carries electronic components and head gaps, in a metallic cavity mold. The mold includes selectively placed rubber inserts. These inserts are located such that an insert engages the ceramic cards at the area of the head gap, and such that inserts engage the cards in the vicinity of the electronic components to effectively place these components outside the mold cavity. The subsequent injection of a plastic molding compound into the mold cavity selectively encapsulates the cards, leaving the head gap area and the electronic components free of molding compound.

3,712,576

WALER CLAMPING ASSEMBLY FOR A CONCRETE WALL FORM

Richard T. Dagiel, Elk Grove Village, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed April 16, 1971, Ser. No. 134,667
Int. Cl. E04g 11/00
U.S. Cl. 249—192 9 Claims



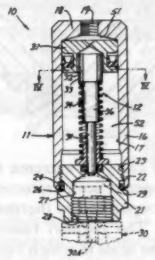
A three-piece inseparable clamp assembly which, in one form thereof, is applied to the meeting edges of a pair of steel-studded concrete wall form panels in order to clamp a pair of walers in position against such panels, and in another form thereof, is applied to a waler in order to clamp a pair of strong-backs in position against the waler.

3,712,577

RESET OPERATOR FOR PRESSURE FLUID VALVE

Stanley M. Loveless, Oshtemo, Mich., assignor to General Gas Light Company, Kalamazoo, Mich.

Filed Feb. 24, 1970, Ser. No. 13,307
Int. Cl. F16k 31/143; F15k 15/17
U.S. Cl. 251—23 10 Claims



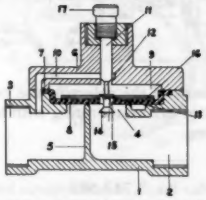
An automatically resettable, fluid-actuated, operating device for controlling an external device, such as a spool valve assembly. The operating device includes a housing having a chamber in which is slideably positioned a piston. A spring is positioned in the chamber for normally urging the piston toward one end of the chamber. Pressurized fluid supplied to said one end of the chamber causes the piston to move away from said one end position for causing actuation of the external device. The piston contains a small bleed passageway therethrough for permitting controlled flow of fluid to the other side of the piston whereby, after a predetermined time, the fluid and the spring adjacent the other side of the piston return the piston to its original end position. The piston is provided with a resilient seal ring which substantially functions as a one-way check valve for permitting the fluid adjacent said other side of the piston to be rapidly vented.

3,712,578

CONTROLS FOR VALVES

Peter Leonard Dawson, 8 Contour Road, Krugersdorp, South Africa

Filed Aug. 24, 1970, Ser. No. 66,492
Claims priority, application South Africa, Aug. 26, 1969, 69/6192
Int. Cl. F16k 31/385
U.S. Cl. 251—35 6 Claims



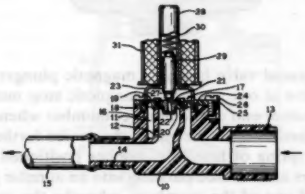
The invention relates to valves wherein the passageway therethrough is closed by a diaphragm and fluid pressure in the line in which the valve is located is used to close the valve. The valve is controlled by an auxiliary valve in a by-pass passage enabling the escape of fluid under pressure acting on the diaphragm to close the valve and a shaped member located in an aperture through the diaphragm such that there is co-ordination between the flow through the aperture and movement of the auxiliary valve.

3,712,579

SOLENOID VALVE PLUNGER

Myles N. Murray, Chagrin Falls, and Dale M. Beaver, Mayfield Heights, both of Ohio, assignors to Industrial Electronic Rubber Company, Twinsburg, Ohio

Filed Aug. 24, 1970, Ser. No. 66,208
Int. Cl. F16k 31/385, 31/40
U.S. Cl. 251—38 1 Claim



The plunger has a molded-on rubber body of right cylindrical exterior shape for coaction with a relatively rigid diaphragm orifice. The molding is done in a mold which crimps the end of the plunger to seal the cavity, with injection of the rubber to the same.

3,712,580

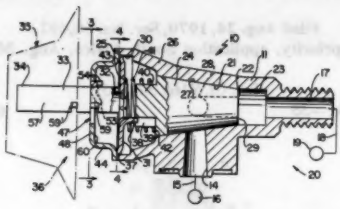
FLUE CONTROL DEVICE AND SYSTEM UTILIZING THE SAME

Harvey J. Shopsky, Latrobe, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed March 31, 1971, Ser. No. 129,701
Int. Cl. F16k 35/00
U.S. Cl. 251—96 7 Claims

A fuel control device wherein the manual selector is axially movable relative to a valve housing to unlock the selector therefrom and is movable in a rotational direction relative to the housing to drive a fuel control valve member between its operating positions. In order to prevent wobble of the selector as the same is being moved relative to the valve member and/or relative to the housing, the selector and the housing

each respectively has a pair of axially spaced guides cooperating respectively with the pair of guides on the other member



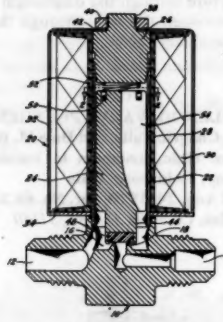
so that in all positions of the selector, the two axially spaced guides of the selector are cooperating with the axially spaced guides of the housing.

3,712,581

SOLENOID COMBINED SHADING COIL AND RETURN SPRING

John Parlow, Arnold, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 2, 1970, Ser. No. 86,020
Int. Cl. F16k *31/06;* **H01f** *7/12*
U.S. Cl. 251—129 **1 Claim**



An a.c. solenoid valve having a magnetic plunger member carrying a valve at one end and a magnetic stop member engaged by the other end of the plunger member when the solenoid is energized to open the valve, the device further including a helical spring of beryllium copper positioned between these members and entered partially into an annular groove in the surface of one of the members, whereby the spring provides conductive turns around a portion of one of the members defined by the groove, thereby to provide a shaded pole portion, and whereby the spring has sufficient resiliency to return the valve to a biased closed position when the solenoid is de-energized.

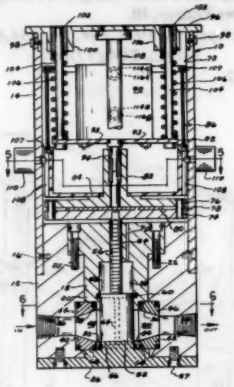
3,712,582

FLUID FLOW CONTROL VALVE AND LINEAR ACTUATOR THEREFOR

Donald L. Moesta, 38046 Jamison Drive, Livonia, Mich.

Filed July 16, 1970, Ser. No. 55,431
Int. Cl. F16k *31/04;* **H02p** *3/04*
U.S. Cl. 251—134 **10 Claims**

A support housing having a cylindrical bore in which a complementary cylindrical spool valve is carried and screw-threadedly engaged with the housing, the valve being rotated by a drive motor for linear movement of the valve in the bore, an inlet port and an outlet port opening to the bore so that communication therebetween is accurately controlled by the linear positioning of the spool valve, a pulse drum structure connected with and rotating with the spool valve and having sensor points thereon which, as the pulse drum rotates with the valve, pass by a sensing device which is thus enabled to sense linear change of position of the drum and hence its associated valve, and a control system operatively connected



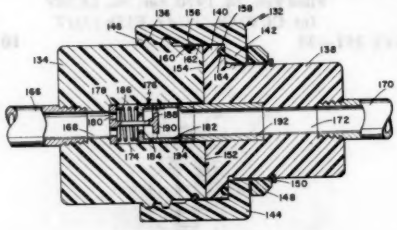
with the sensing device and the drive motor for actuating the valve to accurately located positions providing selected flow rates through the valve.

3,712,583

VALVED FOR LINES CARRYING EXTREME TEMPERATURE FLUIDS

David L. Martindale; Alan M. Dale, both of La Mesa; Richard C. Mursinna, San Diego, and Gene R. Rewerts, Lakeside, all of Calif., assignors to Ametek, Inc., El Cajon, Calif.

Filed Jan. 25, 1971, Ser. No. 109,373
Int. Cl. F16l *29/00, 37/28*
U.S. Cl. 251—149.4 **17 Claims**



A coupling for lines carrying extreme temperature fluids, such as fluids at cryogenic temperatures, that employs an inner and an outer seal separated by thermal insulating material with parallel faces. The parallel faces form a restricted sealed space between the seals in which vapor that may escape through the inner seal is trapped forming a vapor barrier to further leakage through the inner seal and to thermal conductivity of the extreme temperature of the conducted fluid to the outer seal, thus allowing the outer seal to be an ambient temperature seal.

3,712,584

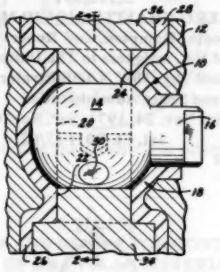
VALVE AND METHOD OF MAKING SAME

Eugene H. Wise, Saugus, and Homer W. Galt, Burbank, both of Calif., assignors to The Susquehanna Corporation, Fairfax County, Va.

Continuation of Ser. No. 857,058, Sept. 11, 1969, abandoned. This application Feb. 17, 1971, Ser. No. 116,210
Int. Cl. F16k *5/20*
U.S. Cl. 251—162 **9 Claims**

A valve of the type wherein a valve member having a passageway therethrough is rotatably mounted within a valve

body or housing having inlet and outlet passages. The valve body is provided with one or more raised portions on its interior surface which serve to firmly engage or bias the valve member when it is rotated to the closed position, thereby preventing leakage be the valve member and the body. In the manufacture of such a valve in accordance with the method of the present invention, the valve body is formed of a suitable



plastic material and is molded about the valve member. The valve member is placed in the open position in the mold and is provided with one or more recessed portions on the outer surface thereof so that complementary raised portions are formed on the inner surface of the molded valve body which serve to firmly engage or bias the valve member when it is rotated to the closed position.

3,712,585

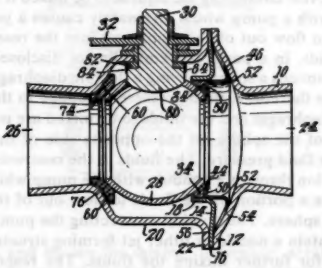
SEALS FOR BALL VALVES

Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Worcester, Mass.

Filed Aug. 27, 1970, Ser. No. 67,360

Int. Cl. F16k *5/20*

U.S. Cl. 251—174 **1 Claim**



A seal and seat construction for the ball of a ball valve including an annular upstream elastomeric seal having a general wedge conformation and an annular spring for holding the same, the spring having an outer peripheral area held by the parts of the housing of the ball valve and an inner offset annular member impinging upon the seal causing it to press against the exterior surface of the ball valve about the inlet opening thereof. There is also a new and improved elastometric seal for the downstream side of the ball including a metal retainer preventing extrusion of the seal material.

3,712,586

SPARE TIRE EXTRACTOR ASSIST DEVICE

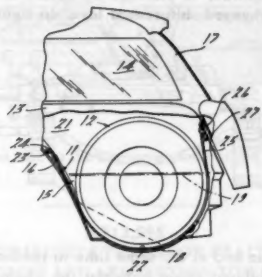
Myron M. Nicholson, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 27, 1971, Ser. No. 184,131

Int. Cl. B66f *1/00*; **B66d** *1/00*

U.S. Cl. 254—1 **4 Claims**

An extractor device for assisting in the removal of a spare tire and wheel assembly from a deep storage well or recess adjacent a vehicle body interior side panel. The extractor device comprises a sling adapted to be draped across the bottom of the recess. The sling is anchored to a vehicle body structure at



one of its ends and equipped with a pull cable at its other end. The sling is adapted to be raised to a height at which the spare tire and wheel assembly can be tilted onto the vehicle floor adjacent the recess.

3,712,587

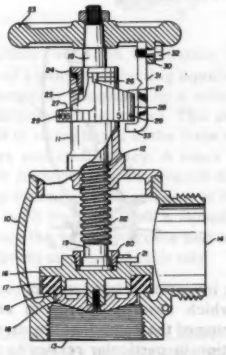
FLOW RESTRICTING VALVE

Glenn E. Specht, Charles Town, W. Va., assignor to American LaFrance Inc., Willoughby, Ohio

Filed May 12, 1971, Ser. No. 142,549

Int. Cl. F16k *51/00*, *17/14*

U.S. Cl. 251—285 **6 Claims**



A flow restricting valve having a valve seat and a movable valve element and means for moving the valve element toward and away from the valve seat. A device on said means for moving the valve element engageable with a collar on said flow restricting valve acting to limit the movement of said means for moving the valve element and wherein one edge of said collar is formed in a spiral engageable with an abutment on said flow stricting valve whereby the relative positioning of the collar is determined by its engagement with said abutment.

3,712,588

CHAIN ACCESSORY DEVICE

Frederick J. Coil, 109 Latham Trailer Courts, Latham, N.Y.

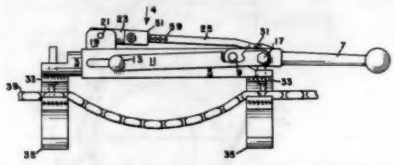
Filed July 12, 1971, Ser. No. 161,746

Int. Cl. B66f *3/00*

U.S. Cl. 254—78 **10 Claims**

Discloses a chain accessory device for mounting a chain to be repaired, and for tightening same and at the same time rendering slack a portion of the chain for purposes of repair. A barrel slide member is slidable within a main-body member, with both members having depending, cylindrically configured, upper and lower chain guides accommodating,

respectively, a small chain or large chain. Aligned holes in the slide member, main-body member and chain guides receive chain pins to engage and retain the chain accommodated. Relative rectilinear movement of the barrel slide member and main-body member is effected by rotary movement of an operatively engaged, bifurcated lever to tighten the accommodated chain and at the same time to render the portion of the accommodated chain between the chain pins slack for purposes of repair. As a safety feature, the lever is rotatable beyond its position of greatest force application to positive-lock position. An added safety feature is provided by a pawl retentively engageable with ratchet teeth.

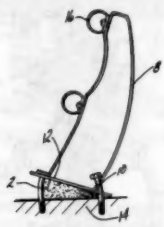


3,712,589

POROUS OR FOAMED METAL ENERGY ABSORPTION DEVICE

Warren S. Peterson, Guilford, and Clarence M. Tyler, Jr., New Haven, both of Conn., assignors to Olin Corp., New Haven, Conn.

Filed June 24, 1971, Ser. No. 156,447
Int. Cl. E01f *15/00*
U.S. Cl. 256—13.1 **5 Claims**



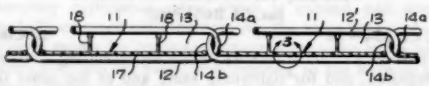
The instant invention relates to a porous or foamed metal component which absorbs energy in an inelastic manner through curshing of the component by an external object. The instant invention in particular relates to a barrier such as a highway barrier, bridge barrier, or vehicle bumper wherein the porous or foamed metal component, and preferably a foamed aluminum component is operatively positioned so as to inelastically absorb energy upon impact.

3,712,590

SLATS FOR A CHAIN LINK FENCE

Irving A. Tochner, Yorba Linda, Calif., and Walter T. Savinsky, La Mirada, Calif., assignors to Manner Plastic Materials, Inc., Compton, Calif.

Filed July 28, 1971, Ser. No. 166,671
Int. Cl. E04h *17/14*
U.S. Cl. 256—34 **10 Claims**



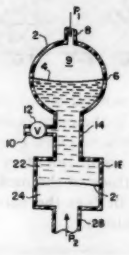
Extruded plastic slats are adapted for tight-fitting insertion into the channels formed by the flattened helical strands of a chain link fence. Each slat has a planar portion of width equal to the channel wide dimension, and one or more legs extending perpendicular to the planar portion across the narrow dimension of the channel. Preferably, the interior of each slat is of cellular configuration, the slat having a specific gravity of between 0.4 and 1.0. Alternatively, slats of rectangular cross-section may be employed.

3,712,591

ZERO GRAVITY LIQUID MIXER

Franklin W. Booth, Hampton, and Robert A. Bruce, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 24, 1971, Ser. No. 201,782
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 **13 Claims**



Apparatus for mixing liquids under conditions of zero gravity is disclosed. The apparatus is comprised of a closed reservoir for the liquids, having a means for maintaining a positive pressure on the liquids in the reservoir. A valved liquid supply line is connected to the reservoir for supplying the reservoir with the liquids to be mixed in the reservoir. The portion of the reservoir containing the liquids to be mixed is in communication with a pump which alternately causes a portion of the liquids to flow out of the pump and into the reservoir to mix the liquids. In a particular embodiment disclosed, the reservoir comprises a sphere having a flexible diaphragm across the diameter thereof. A fluid pressure is applied to the upper side of the diaphragm and the fluids to be mixed are pumped into a section of the sphere on the opposite side of the diaphragm from the fluid pressure. The fluids in the reservoir are in communication through a conduit with the pump which alternately causes a portion of the fluids to flow out of the pump and into the sphere. The conduit connecting the pump and sphere may contain a nozzle or other jet-forming structure such as a venturi for further mixing the fluids. The reservoir may be completely emptied of liquids stored therein.

3,712,592

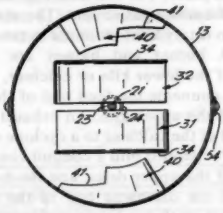
FUEL BLENDER

Edgar H. Heatcoat, Box 354, Assiniboia, Canada

Filed April 6, 1971, Ser. No. 131,598
Claims priority, application Canada, April 18, 1970, 079,550
Int. Cl. B01f *7/16*
U.S. Cl. 259—108 **3 Claims**

A fuel mixer, blender and container, said container being of a specific volume and having a spout through which the container is filled and from which contents in the container are dispensed. A stirring device for blending the fuel is rotatably mounted in the container and includes pairs of agitator blades mounted on a shaft and sloped in opposite directions relative to one another and inclined with respect to the longitudinal axis of the shaft on which they are mounted. The shaft is journalled in the top and bottom walls and rotated by a crank detachably connected thereto. Deflector blades, fixed to the container walls, are located within the container and are

sloped at an angle to the axis of the shaft. The spout is located to provide a selected volume providing proper proportions of



fuel and oil in a mixture for a two-cycle internal combustion engine.

3,712,593

METHOD OF AND DEVICE FOR CONTINUOUS PREPARATION OF GRANULAR MATERIAL, SUCH AS FOUNDRY SAND

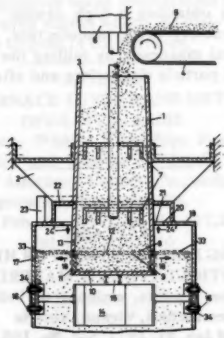
Franz Szatmari, Schaffhausen, Switzerland, assignor to Giorg Fischer A. G., Schaffhausen, Switzerland

Filed March 23, 1971, Ser. No. 127,210

Claims priority, application Switzerland, April 3, 1970, 4938/70

Int. Cl. B01f *7/16*

U.S. Cl. 259—148 **12 Claims**



A method and device for mixing, loosening, aerating and cooling granular material is disclosed where the material to be treated is introduced into two axially arranged cylindrical containers spaced at a small distance one from another to provide a discharging gap therebetween. At least one of the containers is rotated by a driving motor so that the contacting grain layers in the gap will rub together and subsequently are discharged by centrifugal forces from the gap.

3,712,594

VENTED SCREW EXTRUDER WITH PRESSURE AND FLOW REGULATING MEANS

Heinz Schippers, and Friedheim Hensen, both of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Nuppertal, Germany

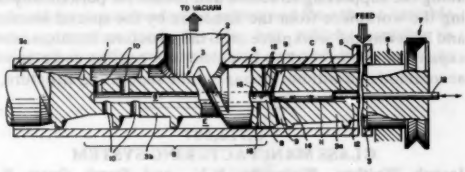
Filed June 28, 1971, Ser. No. 157,194

Claims priority, application Germany, June 27, 1970, P 20 31 935.1

Int. Cl. B01f *7/08*

U.S. Cl. 259—191 **10 Claims**

A vented two-stage screw extruder for processing thermoplastic polymers wherein an axially positioned valve means, especially a slide valve in a central bypass, is provided for regulating the pressure and flow of a polymer melt from



the compression side to the expansion side of the two-stage extruder.

3,712,595

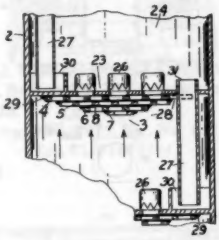
UPFLOW DISTRIBUTIVE TRAYS FOR FRACTIONATING COLUMNS AND ABSORPTION TOWERS

Abraham Adler Hirsch, 141 Norwood Street, Shreveport, La.

Filed July 12, 1971, Ser. No. 161,748

Int. Cl. B01d *3/18, 3/22*

U.S. Cl. 261—114 R **21 Claims**



The ascending phase, vapor in distillation columns, and vapor or the lighter of a pair of contacting liquids in an absorption tower flows unequally according to a velocity profile at points across the diameter of the vessel. This causes unequal distribution of vapor or rising liquid to the trays with attendant operating difficulties and inefficiency. A stack of perforated baffles or wire mesh discs of different overall diameters, with the largest at the top tapering to the smallest at the bottom, attached underneath each tray interpose a varied hydraulic resistance to counteract the velocity profile and hence equalize vapor or liquid upflow to all areas of each tray.

3,712,596

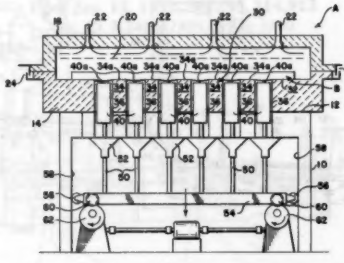
METHOD AND APPARATUS FOR HEATING AN ELONGATED METAL WORKPIECE

F. Troy Cope, Salem, Ohio, and James V. Burrell, Detroit, Mich., assignors to The Electric Furnace Company, Salem, Ohio

Filed Sept. 28, 1970, Ser. No. 75,826

Int. Cl. F27d *3/00*

U.S. Cl. 263—6 R **5 Claims**



A furnace for heating an elongated metal workpiece having a lower surface, which furnace includes a heating chamber

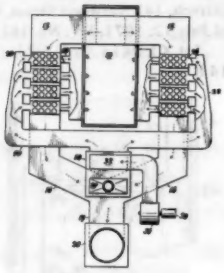
and a lower elongated workpiece supporting structure within the chamber. There is provided a series of elements spaced along the supporting structure and means for periodically lifting the workpiece from the structure by the spaced elements and lowering the workpiece onto the structure. In this manner, expansion of the workpiece during the heating cycle can be accommodated without damage to the supporting structure.

3,712,597

GLASS MANUFACTURING SYSTEM

Joseph Waitkus, Wellsville, N.Y., and Derek Orem Van Buskirk, Mars, Pa., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Nov. 18, 1970, Ser. No. 90,531
Int. Cl. F27d *17/00*; F23l *15/04*
U.S. Cl. 263—15 R **6 Claims**



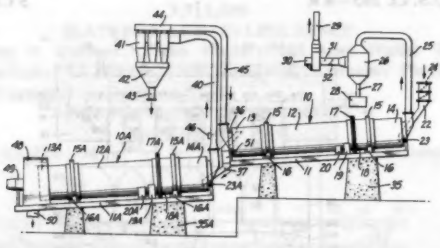
An arrangement for manufacturing glass at a continuously high temperature that involves a system utilizing a rotary regenerative air preheater in combination with a recuperative heat exchanger of the bayonet type to provide preheated air to a glass tank for combustion therein at a uniformly high temperature and at a constant rate of flow.

3,712,598

ROTARY APPARATUS FOR TREATING COLEMANITE ORE

Donald E. Miles, Altadena, Calif., assignor to Stansteel Corporation, Los Angeles, Calif.

Filed April 22, 1971, Ser. No. 136,331
Int. Cl. F27b *7/02*
U.S. Cl. 263—32 R **4 Claims**



Colemanite ore is treated to prepare pure calcined colemanite which is substantially free of the ore gangue. The ore is first dried to remove all uncombined water, then calcined with a stream of hot gas at a temperature sufficient to fracture the colemanite crystals into small particles which are selectively picked up from the ore by the gas stream and carried in the gas stream in which the final calcination of the colemanite takes place. The calcined colemanite particles are then separated from the gas stream. The method can be carried out with two rotary kilns mounted in tandem and tilted for gravity feed. A burner and blower are mounted at the discharge end of the lower kiln or calciner, and a feed chute with a gas lock connects the feed end of the calciner to the discharge end of the upper kiln. An exhaust stack leads from the ore inlet end of the calciner to a cyclone separator, the gas exiting from the separator into a conduit connected to the ore discharge end of the upper drier, and the balance of the ore discharges from the discharge end of the calciner. A feed chute and exhaust stack are connected to the feed end of the upper drier.

3,712,599

METHOD OF PRODUCING HIGH DENSITY REFRACTORY GRAIN FROM NATURAL MAGNESITE

Ben Davies, Pittsburgh, and Dwight S. Whittemore, Bethel Park, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed March 15, 1971, Ser. No. 124,543
Int. Cl. F27b *19/04*
U.S. Cl. 263—52 **6 Claims**

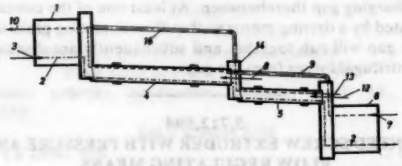
A method for obtaining a high density refractory grain, suitable for refractory brick manufacture, from a coarsely crystalline natural magnesite by milling the crystalline magnesite to a small particle size before and after caustic calcining.

3,712,600

HEATING INSTALLATION FOR HEATING PARTICULATE RAW MATERIALS

Anton Landthaler, Austria, assignor to Veitscher Magnesitwerke Aktiengesellschaft, Vienna, Austria

Filed Jan. 21, 1971, Ser. No. 108,461
Claims priority, application Austria, Jan. 22, 1970, 607
Int. Cl. F27b *7/02*
U.S. Cl. 263—32 R **3 Claims**



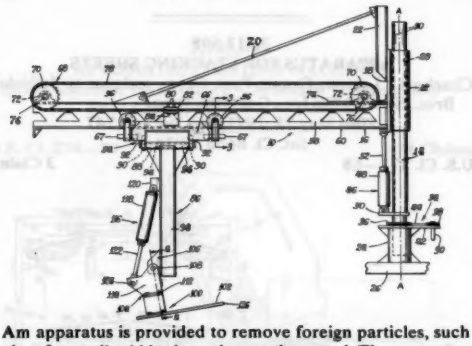
A succession of interconnected rotary kilns are independently heatable, with the burner of at least one kiln receiving an oxygen supply. The exhaust gases from the kilns are delivered to a pre-heating station for the raw material at the input end of the installation, and the combustion air is preheated at the output end by the heat released from the heated raw material.

3,712,601

APPARATUS FOR REMOVING A FOREIGN SUBSTANCE FROM A LIQUID BATH

Jesse C. Brown, Delanco, N.J., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Oct. 6, 1971, Ser. No. 186,840
Int. Cl. F27d 23/00
U.S. Cl. 266—37 10 Claims



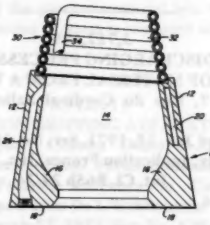
Am apparatus is provided to remove foreign particles, such as slag, from a liquid bath, such as molten steel. The apparatus includes a plate which may be moved through an angle of 90° from a vertically extending position to a horizontally extending position. The plate is located in a horizontal position beneath the particles to be removed and then raised upwardly away from the liquid bath thereby lifting the particles. A movable trolley-cantilever boom arrangement is used to move the plate to a dumping station where the plate is moved to its vertical position to dispose of the particles.

3,712,602

BLAST FURNACE TUYERE AND METHOD OF OPERATING SAME

Marinus L. Brown, Wilkins Township; Paul J. La Rosa, Shaler Township; and Charles M. Sciulli, Jr., Whitehall Borough, all of Allegheny County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 22, 1971, Ser. No. 117,275
Int. Cl. C21b 7/16
U.S. Cl. 266—41 1 Claim



A blast furnace tuyere having a nose portion and a rear portion, each of which are independently water cooled by separate circulation systems. The nose portion thereof comprises nothing more than helically wound tubing, with each end thereof extending back through the rear portion to provide an inlet and outlet for the cooling water.

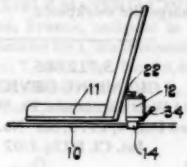
3,712,603

SUSPENSION UNIT FOR VEHICLE SEATS

William Percy Hickinbotham, 253 Betsy Lane, Stafford, England

Filed Feb. 16, 1971, Ser. No. 115,160
Claims priority, application Great Britain, Feb. 17, 1970, 7,465/70
Int. Cl. F16c 5/00
U.S. Cl. 267—131 7 Claims

A suspension unit primarily for vehicle seats comprises a block-like body formed with two intercommunicating chamber containing hydraulic fluid, and valve means for controlling the rate of flow of fluid between the chambers produced by movement of the piston in its chamber. One of the chambers accommodates a piston and the other a variable volume pre-pressurized flexible bay which contains a preselected quantity of compressed gas and is arranged to



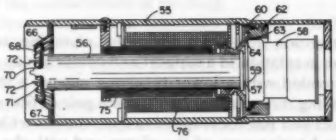
pressurize the fluid in the chambers. The body of the unit is also formed with a hydraulic reservoir and with a bore which accommodates a combined pump and release valve operable by a common handle and reciprocable plunger for transferring fluid between the reservoir and the chambers to adjust the pressurization of the fluid by compression or expansion of the container.

3,712,604

MECHANICAL SPRING CONSTANT LOAD DEVICE

Melvin S. Nation, Bensenville, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed April 26, 1971, Ser. No. 137,285
Int. Cl. F16f 1/34
U.S. Cl. 267—161 9 Claims



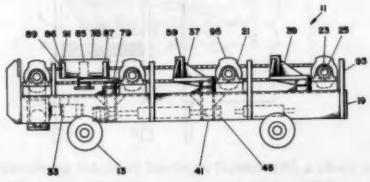
A spring member having conically extending resilient fingers which bear against a disc provides a constant load to a shaft coupled to the disc in the presence of movement of the shaft from a fixed axial position. The constant load device can be used in many mechanical applications such as an automobile chassis spring or a spring for a friction clutch. The constant load device can also be used in electronic applications, such as for holding a vidicon in assembled position with an electron intensifier.

3,712,605

APPARATUS FOR CLAMPING AND DISCHARGING WORKPIECES

John L. Parris, Knoxville, and Herman J. Oldham, Oak Ridge, both of Tenn., assignors to The Carborundum Company, Niagara Falls, N.Y.

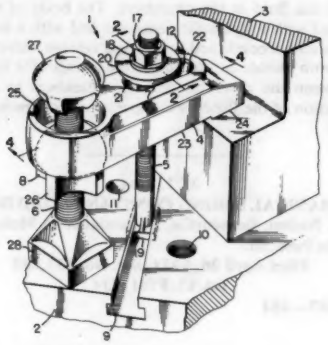
Filed Jan. 12, 1971, Ser. No. 114,913
Int. Cl. B24b 41/06; B23g 3/00
U.S. Cl. 269—14 7 Claims



In a workpiece clamping and discharging device for a frame, a work-engaging member is journaled for rotation about a ver-

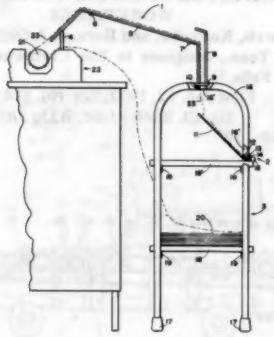
tical axis adjacent the workpiece. As the work-engaging member is turned, an inclined surface thereon which is spaced from the axis of rotation slidably contacts the workpiece to push the workpiece upwardly and outwardly. Further turning of the work-engaging member causes an abutment at the upper portion of the inclined surface to engage the workpiece thereby laterally urging the workpiece across the frame so as to clamp or discharge the workpiece.

3,712,606
CLAMPING DEVICE
Gail R. Cole, 4704 West Esplanade, Ft. Wayne, Ind.
Filed Dec. 4, 1970, Ser. No. 95,076
Int. Cl. B23q *3/02*
U.S. Cl. 269—92 **14 Claims**



This invention involves a device for clamping items to be worked on in relation to a support and comprises an elongated clamp provided with a lower receiving means, a shaft and a rod extending through the clamp, and a pair of fittings carried by the shaft and rod for respective cooperation with an upper portion or bearing area of the clamp and with the receiving means in a manner whereby the clamp may be caused to readily tilt and adjust itself to the work for clamping it to the support.

3,712,607
FAN-FOLD PAPER GUIDES AND STACKING MECHANISMS
Douglas G. Ziegler, and Roy T. Spurlock, Jr., both of 109 Sheridan Ave., Takoma Park, Md.
Filed April 2, 1971, Ser. No. 130,618
Int. Cl. B65h *45/00*
U.S. Cl. 270—61 F **1 Claim**

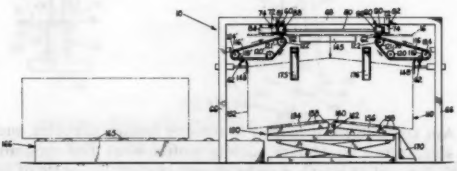


This invention relates to paper guides and paper stacking mechanisms, and more particularly to guides and stacking mechanisms for continuous paper forms of single or multiple ply of the variety known as fan-fold or accordion fold, during its passage from a printing device, over a guide, and through a stacking mechanism to a collecting table.

ERRATUM

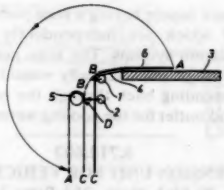
For Class 270—79 see:
Patent No. 3,712,610

3,712,608
APPARATUS FOR STACKING SHEETS
Charles L. Larson, Grants Pass, Oreg., assignor to Jeddeloh Bros., Sweed Mills Inc., Gold Hill, Oreg.
Filed May 21, 1971, Ser. No. 145,747
Int. Cl. B65h *29/34*
U.S. Cl. 271—68 **3 Claims**



Stacking apparatus for automatically transferring sheets from a conveyor into a stack. Sheets to be stacked sequentially are moved up an elevator conveyor into engagement with the lower runs of a series of transfer conveyor belts that collectively form a transfer conveyor. Stacking bars, each having a plurality of rollers journaled thereon, are provided below the transfer conveyor. One bar is positioned beneath each end of a given sheet, with the rollers engaging the underside of the sheet to retain it against an adjacent belt of the transfer conveyor for movement therewith. Each bar is attached at its ends to a pair of movable, endless chains that are spaced apart, one on either side of the stack to be formed. The endless chains are supported on sprockets to transfer orbital paths, and are selectively movable whereby a bar is retained beneath a sheet until it is positioned over the stack, whence the bar is moved outwardly beyond the end of a sheet whereby the sheet drops upon the top of the stack.

3,712,609
DEVICE FOR DISCHARGING PROCESSED OR WORKED LENGTHS OF MATERIAL FROM A WORK TABLE
Roger Robert, 7, Rue du Cardinal Saliege, Saint Quentin, France
Filed Jan. 15, 1971, Ser. No. 106,777
Claims priority, application France, Jan. 16, 1970, 7001640
Int. Cl. B65h *29/24*
U.S. Cl. 271—74 **2 Claims**



A device for discharging processed or worked lengths of material from a work table the lengths having a part lying on the work table and a part hanging over an edge thereof. The device includes a pair of parallel superposed perforate conduits spaced from the edge of the table and connected to a source of compressed air, and a receiving bar pivoted about an

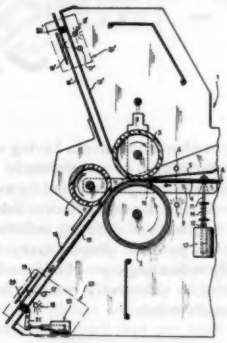
axis below the table on which the lengths are eventually straddled. The upper conduit is positioned at the level of the work table and the lower bar is positioned at the same level as the receiving bar. The jet of air formed by the lower conduit retains the portion hanging over the end of the table against the receiving bar while the jet of air formed by the upper conduit flips the part of the length lying on the table onto the receiving bar such that the length is straddled on the receiving bar.

3,712,610

AUTOMATIC PLEATING MACHINES

Vittorio Garrone, Via Rivadora 6, S. Mauro Torinese, Italy

Filed Sept. 2, 1971, Ser. No. 177,897
Int. Cl. B65h 45/20
U.S. Cl. 270—79 4 Claims



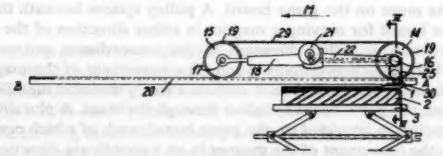
An automatic pleating machine is disclosed comprising two main rollers which are driven continuously in one direction, a jockey roller mounted at the ends of a pair of pivoted levers and two guide channels for the pleated material. The jockey roller is so mounted on the levers that it can rest on either one or the other of the main rollers to form a path to either one or the other of the guide channels for material passing between the main rollers. Photocells are located near the ends of the guide channels to detect the approach of the material being folded to cause the pivoted levers to move so that the jockey roller commutes from one roller to the other thereby forming a pleat and guiding the pleated material into the other guide channel where the same process is repeated until the sheet of material is used up.

3,712,611

SUCTION GRIPPING APPARATUS

Michel Jules Jacquot; Charles Gustave Amicel, both of Yvelines, and Marie Michel Fernand Renaudon, Hauts de Seine, all of France, assignors to Centre D'Etudes Techniques Des Industries De L'Habillement

Filed March 17, 1971, Ser. No. 125,057
Claims priority, application France, March 17, 1970, 7009489; Oct. 15, 1970, 7037247
Int. Cl. B65h 3/10
U.S. Cl. 271—11 18 Claims



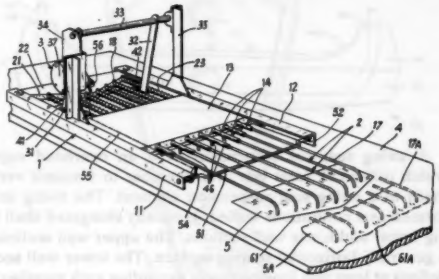
A suction gripping apparatus particularly for fibrous material which includes a nozzle one dimension of which is not greater than twice the average diameter of the fibers of the fibrous material, the nozzle being pivoted with coupling means to secure the nozzle to a vacuum source.

3,712,612

DEVICE FOR THE DISPLACEMENT AND ALIGNMENT OF PIECES OF FLEXIBLE MATERIAL IN SHEET FORM

Jean Guichard, Yerres, France, assignor to Centre D'Etude Techniques Des Industries De L'Habillement, Paris, France

Filed Dec. 7, 1970, Ser. No. 95,461
Claims priority, application France, Dec. 8, 1969, 6942305
Int. Cl. B65h 5/16
U.S. Cl. 271—54 13 Claims



The invention relates to a device for the displacement and alignment of pieces of flexible material in sheet form, more especially of pieces of fabric or plastic material in sheets intended for the manufacture of clothing.

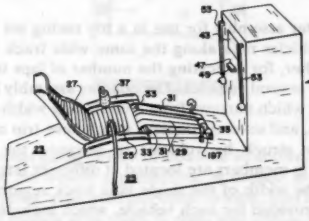
The device comprises at least two movable displacement members which are adapted to press against a maintaining member, a portion of a piece that is to be displaced, and which are mounted upon a support so as to be able to describe distinct trajectories, as well as control means adapted to cause each of said movable displacement members to pass from an inactive position where it is remote from said maintaining member to a rear initial position for which it presses the corresponding piece portion against the maintaining member, then, while it is kept in engagement with the said piece portion, to cause it to move forward by carrying this latter along as far as a front arrival position, and finally to move it away from the maintaining member while bringing it back again to its inactive position.

3,712,613

EXERCISING MACHINE

Jack Vincent Feather, Oakland, and John W. Walker, Arroyo Grande, both of Calif., assignors to said Feather, by said walker

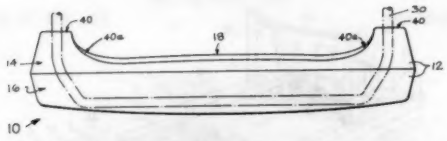
Filed May 5, 1971, Ser. No. 140,427
Int. Cl. A63b 21/02, 21/10, 21/24
U.S. Cl. 272—58 14 Claims



An exercising machine having a frame with a chair mounted therein. the chair includes a seating portion with back rest and front leg rest portions pivotably mounted with respect thereto

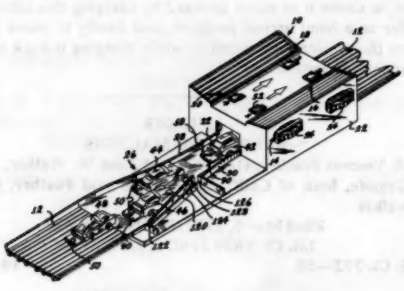
and means carried within the frame for independently pivoting the back rest and leg rest portions between raised and lowered portions.

3,712,614
SWING SEAT
Lawrence M. Sherman, Westport, and James E. Richardson, Weston, both of Conn., assignors to Cambridge Research and Development Group, Westport, Conn.
Filed July 17, 1970, Ser. No. 55,827
Int. Cl. A63g 9/00
U.S. Cl. 272—85 9 Claims



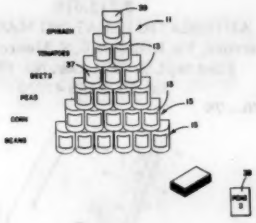
A swing seat for suspension from an overhead support which utilizes at least one arch member to transmit vertical loads to a swing seat suspension element. The swing seat is formed as a continuous walled, generally elongated shell having upper and lower wall sections. The upper wall section has a generally horizontal seating surface. The lower wall section defines at least one longitudinally extending arch member that is positioned between the ends of the lower wall section. A walled aperture located in each end of the swing seat is used to transmit the vertical loads imposed upon the arch member to the suspension element.

3,712,615
MULTIPLE TOY VEHICLE LAP COUNTER
William A. Staats, Torrance; Denis V. Bosley, Palos Verdes Peninsula; John S. Cook, Sunnyvale, and Toshio Yamasaki, Gardena, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 10, 1970, Ser. No. 96,808
Int. Cl. A63f 9/14
U.S. Cl. 273—86 R 3 Claims



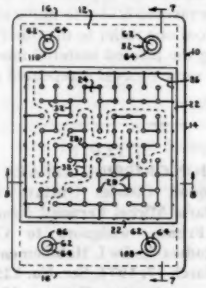
A lap counter assembly for use in a toy racing set wherein several toy vehicles race along the same wide track and can pass one another, for indicating the number of laps traversed by each of the several vehicles. The counter assembly includes a track region which narrows from a multi-lane width to a single lane width, and several counters which have trip members which can be struck by vehicles to advance the counts, wherein the trip members are located at different lateral positions across the width of the single lane track region. An attachment is provided for each vehicle, which includes an upwardly projecting member for moving one of the trip members to register a count as the vehicle passes by it, the projections on the different vehicles located at different lateral positions thereon so that each projection engages a different trip member.

3,712,616
STACKED ELEMENT REMOVAL GAME
Adolph E. Goldfarb, Tarzana, and Rene Soriano, Los Angeles, both of Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif.
Filed Sept. 29, 1970, Ser. No. 76,450
Int. Cl. A63f 9/00
U.S. Cl. 273—1 R 2 Claims



A plurality of can-shaped elements having opposed flat end surfaces having the shape of a semicircle extended by a rectangle, the end walls being connected by a curved side wall along the semi-circle and the two adjacent sides of the rectangle, are provided in groups of differing indicia, the cans being stacked in a vertical pyramid shaped array. Means are provided for randomly indicating cans of a given indicia such that a player is required to selectively remove from the stacked pyramid a can of such indicia.

3,712,617
MAZE GAME
Norman Ohlschlager, 1406 Alabama Street, Lake County, Ind.
Filed May 12, 1971, Ser. No. 142,668
Int. Cl. A63f 9/14
U.S. Cl. 273—153 R 6 Claims

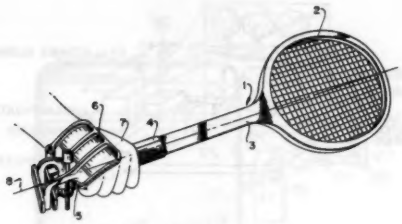


A maze game apparatus in plurality a apparatus comprises of players may participate in playing the game. The game apparatus comprises movable components to change the pattern of the maze on the game board. A pulley system beneath the game board for moving a magnet in either direction of the *x* coordinate, in either direction of the *y* coordinate and any resultant direction therebetween. The movement of the magnet beneath the game board attracts a freely movable metallic ball on the game board to follow through the maze. A plurality of knobs are provided on the game board, each of which controls the movement of the magnet in an *x* coordinate direction and a *y* coordinate direction so that a plurality of players may participate by controlling the movement of the magnet in a coordinate direction with the result that all players must cooperate to lead the ball through the maze.

3,712,618
TENNIS RACKET ATTACHMENT

Paul G. Berzatzy, 231 North Robinson Street, Schenectady, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,769
Int. Cl. A63b 49/08
U.S. Cl. 273—75 34 Claims

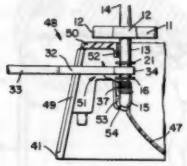


A brace and locator to assist a tennis player in gripping a conventional tennis racket is provided with a surface engageable with the back of the gripping hand, which surface is universally adjustable and rigidly braced with respect to a mounting portion to be rigidly secured to a conventional tennis racket handle without engaging any portion of the normal handle grip. The surface is rotatably adjustable in three mutually perpendicular planes and translationally adjustable in two perpendicular directions that are each perpendicular to the longitudinal axis of the mounting portion, which longitudinal axis will coincide with the longitudinal axis of the racket handle when assembled. The specifically defined surface engages the player's hand, and means are provided to adjust this surface with respect to a conventional handle to fit any desired grip and hand size.

3,712,619
TOP GAME AND APPARATUS

A. Eddy Goldfarb, and Rene Soriano, both of Los Angeles, Calif., assignors to Adolf E. Goldfarb, Tarzana, Calif.

Continuation of Ser. No. 807,299, March 14, 1969, abandoned. This application Oct. 15, 1970, Ser. No. 81,129
Int. Cl. A63b 67/14
U.S. Cl. 273—108 7 Claims

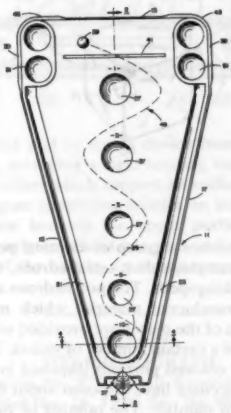


A top game comprising (a) a plurality of spinner units, each of which is the combination of a spindle-type top, a holding means detachably connected to the top so as to support the top but be readily releasable from it, and a string attached to the holding means for winding around the top; and (b) a stadium having a plurality of wall receivers or receiving means for each receiving and supporting a spinner unit so that the holding means may be pulled simultaneously or in rapid succession to spin the tops and introduce them into the stadium for engagement with one another.

3,712,620
SLALOM GAME

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif., and Rene Soriano, Los Angeles, Calif., assignors to said Goldfarb, by said Soriano

Filed Sept. 29, 1970, Ser. No. 76,832
Int. Cl. A63b 3/02
U.S. Cl. 273—120 R 2 Claims

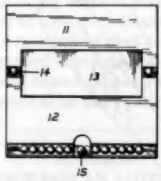


A game comprising an elongated playing board having a first wide end with sidewalls tapering toward a narrow opposite end and a concave upper surface, the curvature of which extends between the sidewalls, the upper surface being inclined downwardly from the first end to the narrow end, and a plurality of longitudinally spaced receiving means located in the upper surface, whereby it is the object of the game to roll a spherical playing piece on the surface from the first end toward the opposite narrow end so that the piece will move from side to side as it rolls down the surface along a path which avoids the receiving means. If the path is imperfect, the playing piece will be caught in one of the receiving means.

3,712,621
INCLINED SURFACE REACTION-TYPE GAME BOARD

Alvin G. Ames, P.O. Box 11191, San Diego, Calif.

Filed Feb. 25, 1971, Ser. No. 118,733
Int. Cl. A63d 3/02
U.S. Cl. 273—120 R 2 Claims

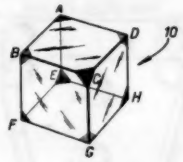


An action game device of box-like structure, having a sloping floor on which a gamepiece is caused to roll from the highest point of an area not open to view, into and through an exposed middle area open to sight and touch, into the lowest and unexposed area—unless the player is able to physically grasp the gamepiece during the split second in which it rushes through the exposed field. Beyond its obvious play value, the invention is designed to develop eye ear and hand coordination.

3,712,622
GAME WITH POLYHEDRAL PLAYING PIECES

Marc Odier, 85, Boulevard Exelmans, Paris, 16e, France

Filed Oct. 13, 1970, Ser. No. 80,353
Claims priority, application France, Oct. 14, 1969, 6935230
Int. Cl. A63f 9/20
U.S. Cl. 273—130 R 16 Claims

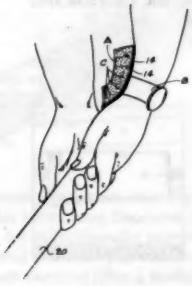


This game comprises a group of identical polyhedron playing pieces, for example, cubes, tetrahedrons, right prisms, or rectangular parallelepipeds. The polyhedrons are formed of a transparent or translucent material which may be slightly tinted. The apices of the pieces are provided with indicia each designating one of a certain number of values. The values may be designated by colored portions disposed in the vicinity of the apices or by arcuate lines disposed about the apices varying in radius or in number. The number of playing pieces is such that each combination of values is produced once and only once in the group of playing pieces. An additional playing element may be added to the said group in order that the resultant number of playing pieces, including the additional piece, is divisible by a greater number of factors. This construction enables the verification of the values of juxtaposed apices of adjacent pieces in position without displacement.

3,712,623
GOLFING AID

Samuel F. Donnald, 227 South Main St., Honea Path, S.C.

Filed May 12, 1972, Ser. No. 252,584
Int. Cl. A63b 69/36
U.S. Cl. 273—183 B 2 Claims

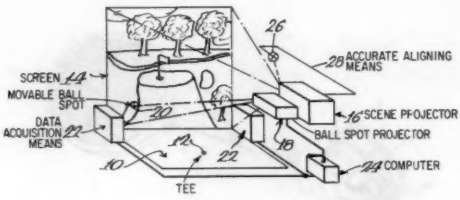


A device for aiding golfers in improving their swing which includes an elongated flexible foam rubber pad having notches on the inner surface thereof. A wrist band is provided for securing such to a golfer's hand so that the elongated pad will extend from adjacent the thumb to slightly above the wrist. The golfer, by observing whether the notches are open or closed, is able to determine if his wrist is breaking backward while driving a golf ball.

3,712,624
GOLF GAME

Robert M. Conklin, Muskegon, Mich., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 22, 1967, Ser. No. 685,176
Int. Cl. A63b 67/02, 69/36
U.S. Cl. 273—176 FA 4 Claims

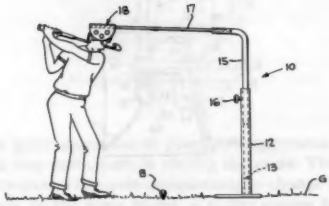


A golf game for accurately and realistically displaying the results of golf shots to a golfer including a tee area whereat a golfer may hit a golf ball, data sensors for providing information relative to the trajectory of a ball hit from the tee by a golfer, a computer responsive to the data sensors for computing the trajectory of the ball, a screen in front of the tee area, a scene projector for projecting a perspective scene of a golf fairway onto the screen including a device for accurately aligning the projected scene at a predetermined location on the screen and a ball spot projector responsive to the computer for projecting a spot of light on the screen and on the scenes displayed thereon to illustrate the trajectory of the ball to the golfer. A plurality of golf fairway scenes illustrating different portions of a fairway having a generally planar surface are employed to be projected onto the screen by the scene projector with each scene having a reference point, the reference point of each scene being located at the same place with respect to the vertical. Also disclosed is a method of providing the perspective scenes including the step of photographing a scaled down golf hole having a planar fairway.

3,712,625
GOLFER'S HEAD MOVEMENT REMINDER DEVICE

James A. Taylor, 1405 Cardinal Place, Greensboro, N.C.

Filed June 21, 1971, Ser. No. 154,918
Int. Cl. A63b 69/36
U.S. Cl. 273—190 R 5 Claims



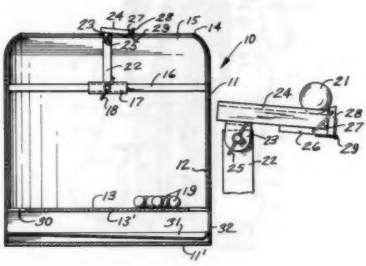
A head reminder device for a golfer in which a vertically adjustable stand is provided as having a horizontal member thereon extending toward the golfer, and an L-shaped head plate is removably mounted at the free end of the horizontal member to serve as a reminder for a right-handed golfer as he practices his golf swing that his head has moved excessively upwardly or to the right during his swing. The head plate is also adaptable for similarly reminding a left-handed golfer of his head moving excessively upwardly or to the left during his swing.

3,712,626

BARREL POOL APPARATUS INCLUDING SPRING PROJECTOR

John L. Rondeau, 306 Avalon Street, Santa Cruz, Calif.

Filed May 3, 1971, Ser. No. 139,716
Int. Cl. A63f *71/02*
U.S. Cl. 273—101 3 Claims



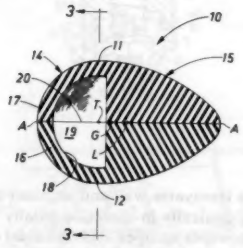
A device of cylindrical shape which includes a lower playing surface on which a multiple number of balls are placed in close proximity with each other. The upper portion of the device includes a sleeve and post member which is slideable upon a bar in order to position an adjustable trough having spring loaded means for urging a ball at any angle desired down into the cylindrical device so as to cause impact with the multiple number of balls.

3,712,627

AMUSEMENT DEVICE

Walter Stroud, 145 Lauder Ave., Toronto, Ontario, Canada

Filed July 30, 1970, Ser. No. 59,566
Int. Cl. A63b *71/00*
U.S. Cl. 273—128 A 1 Claim



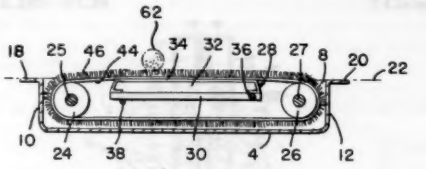
An amusement device having a particularly unpredictable performance when rolled over a playing surface is formed as an ovoid member having a generally hemispheroidal first end portion and a generally paraboloidal second end portion. The first end portion is formed with a hollow structure so that the center of gravity of the ovoid member is spaced apart from the geometric center of the longitudinal axis. The two end portions of the device meet at a maximum diameter position which has a center which is itself spaced apart from both the center of gravity and the geometric center of the longitudinal axis of the device.

3,712,628

GOLF TEEING DEVICE

William L. Boss, Jr., 2807 West Newton, Seattle, Wash.

Filed Dec. 14, 1971, Ser. No. 207,936
Int. Cl. A63b *69/36*
U.S. Cl. 273—195 A 11 Claims



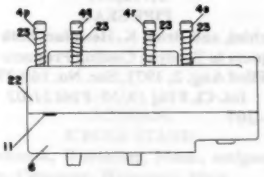
A golf practice mat or teeing device from which golf balls may be struck, including a rigid housing containing horizontally mounted rollers which support an endless belt containing a plurality of grass simulating bristles on its outer surface. A padded platform beneath the upper portion of the belt is mounted so as to pivot about one end, and is held against the inner surface of the belt by an elastic supporting member at the other end.

3,712,629

TOY PHONOGRAPH

Katsumi Watanabe, No. 371, Ozenji, Kawasaki, Japan

Filed Dec. 16, 1970, Ser. No. 98,681
Int. Cl. A63h *3/28*; G11b *3/00*
U.S. Cl. 274—1 A 1 Claim



A toy phonograph comprising a record in which several sound grooves are formed such that their starting points are positioned equidistantly from each other along the outer periphery of the record, a pickup disposed swingably on said record and adapted such that a stylus provided at one end thereof may move radially from the outer periphery of the record toward its center in accordance with rotation of the record, a turntable having a protuberance at the outer peripheral edge thereof, and protrudable and retractable control elements located in the rotary pass of said protuberance in positionally corresponding relation with said respective sound grooves and adapted to contact individually with said protuberance so that when rotation of said turntable having fixedly placed thereon a record is stopped, the selected one of the starting points of said sound grooves will be positioned right below the stylus carried at an end of said pickup.

3,712,630

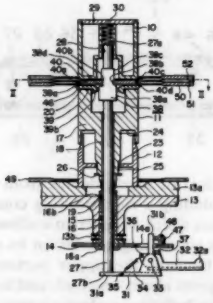
SPINDLE DEVICE FOR AN AUTOMATIC RECORD CHANGER

Koichi Tajime, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed July 23, 1970, Ser. No. 57,619
Claims priority, application Japan, July 31, 1969, 44/59993
Int. Cl. G11b *17/04*
U.S. Cl. 274—10 S 5 Claims

A spindle device for an automatic record changer comprising a shaft mounted in the axial bore of a spindle for elevational motion therein, and a cam attached to the shaft for

elevational motion with the shaft, said cam having a constricted portion in the central portion, a major cam surface in the lower portion and a minor cam surface in the upper portion, hooks and record holders provided to move into and out of the spindle in a direction normal to the axis of the shaft as the cam and shaft move vertically up and down. When the cam and shaft are moved upwardly prior to their downward



movement for changing records, shoulders formed near the forward end of each of the record holders are brought into abutting engagement with the edges of the center openings of records held by the hooks, the amount of movements of the holders and the amount of upward movements of the cam and shaft are restricted and the presence or absence of a record held by the hooks can be detected based on the amount of upward movements of the cam and shaft.

3,712,631

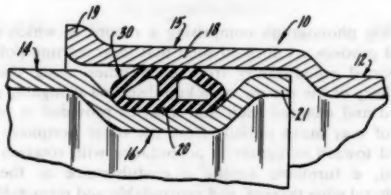
PIPE SEAL

James F. Forchini, and Brian K. Herndon, both of Santa Rosa, Calif., assignors to Ecodyne Cooling Products Company

Filed Aug. 2, 1971, Ser. No. 168,271

Int. Cl. F16j *15/10*; F16l *21/02*

U.S. Cl. 277—207 **11 Claims**



A sealing gasket for the joint between the sections of bell and spigot pipes. The sealing gasket has a substantially triangular transverse cross section and includes a hollow central cavity of substantially triangular transverse cross section. A vertical web divides the hollow central cavity into a pair of side cavities such that each side cavity has a cross sectional area in the range of 8 to 20 percent of the total cross sectional area of the gasket. A plurality of V-shaped ridges are integrally formed on the outer surface of the gasket.

3,712,632

DRILL CHUCK WITH CEMENTED ALIGNING BUSHING

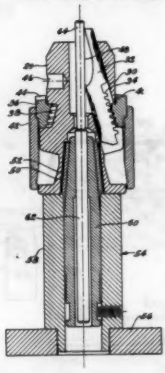
Lawrence W. Wightman, and Thomas J. Long, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 18, 1970, Ser. No. 99,546

Int. Cl. B23b *31/04*

U.S. Cl. 279—1 L **6 Claims**

A key-operated universal drill chuck in which a tapered bushing adapted to receive a tapered driving shaft is entered into an axial bore in the chuck body in loose fitting relation-



ship and cemented therein precisely coaxial with a cylinder held in the chuck jaws.

3,712,633

CHUCK CONSTRUCTION

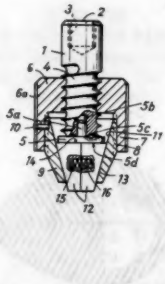
Fritz Schadlich, Stetten, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed May 27, 1970, Ser. No. 40,816

Claims priority, application Germany, June 7, 1969, P 19 28 955.5

Int. Cl. B23b *31/12*

U.S. Cl. 279—58 **7 Claims**



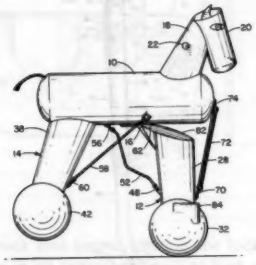
A sleeve has a transverse wall and an inner circumferential surface tapering conically in direction axially away from the transverse wall towards an open end. An axial opening is provided in the transverse wall and a shaft member extends through the same. Cooperating steep-pitch screw threads are provided on the shaft member and in the opening. A plate member is carried by the shaft member within the sleeve in a plane normal to the axis of the shaft member and with freedom of rotation relative to the latter. Anti-friction means is interposed between and cooperates with the plate member and the shaft member. A plurality of gripping jaws is located in the sleeve intermediate the plate member and the open end and each has an axial endface abutting the plate member and an outwardly directed surface complementary to and in engagement with a portion of the inner circumferential surface. Spring means urges the gripping jaws permanently to radially spread-apart position.

3,712,634

RIDEABLE GALLOPING HOBBY HORSE WITH INFLATABLE BODY

Clarence C. Simmons, 1722 N. Winona Blvd. #203, Los Angeles, Calif.

Filed Sept. 13, 1971, Ser. No. 179,734
Int. Cl. A63g 17/00
U.S. Cl. 280—1.182 10 Claims



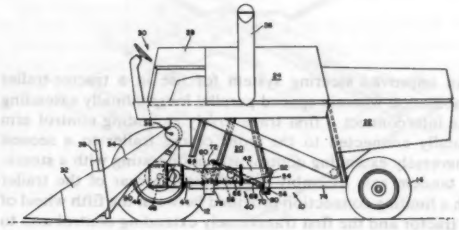
An amusement apparatus having an aft leg component which is securely attached to an inflatable body, a fore leg component pivotally attached to the body, each of the leg components terminating in an inflated sphere, a spring means connected between the fore leg component and the body tending to maintain the fore leg component in the forward position with respect to the body, the body being adapted to be straddled by a rider with the apparatus to be ridden as a horse is ridden with the result that the apparatus is caused to progress along the floor or the ground in a series of leaps generally comparable to the leaping action of a galloping horse.

3,712,635

STRAIGHT LINE SUSPENSION MECHANISM FOR HILLSIDE COMBINE

Marlin Earle Weakly, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Aug. 14, 1970, Ser. No. 63,696
Int. Cl. B62d 21/18
U.S. Cl. 280—43.22 11 Claims



A suspension linkage for effecting straight line vertical adjustment of the front wheels of a hillside combine. Each wheel is mounted on the forward end of a fore-and-aft extending arm, and a pair of vertical and horizontal links interconnect the rear and intermediate portions, respectively, of each arm with the combine frame. An extensible and retractable hydraulic ram acts between each of the horizontal links and the frame to swing the arms and thereby raise and lower the wheels relative to the frame.

3,712,636

BABY CARRIAGE

Georg Gesslein, D-8621 Mannsgereuth, Post Beikheim, Kreis Lichtenfels/Oberfranken, Germany

Filed July 6, 1970, Ser. No. 52,298
Claims priority, application Germany, July 7, 1969, G 69 26 781.8; July 1, 1970, G 70 24 766.4
Int. Cl. B62b 9/10
U.S. Cl. 280—47.38 7 Claims

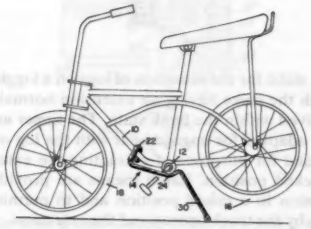
A baby carriage for accommodating babies in a belly-down fashion, having an undercarriage-borne body of walls at least one of which comprises a see-through portion that may be partly or wholly covered by a removable light shade. In a preferred embodiment, at least one body end is higher than the rest of the body and windows extend over the height of said one higher end both at its sides and at its end wall.

3,712,637

CYCLE STAND

Almon F. Townsend, Worcester, Mass., assignor to Persons-Majestic Mfg. Company, Worcester, Mass.

Filed July 21, 1971, Ser. No. 164,715
Int. Cl. B62h 3/10
U.S. Cl. 280—293 1 Claim

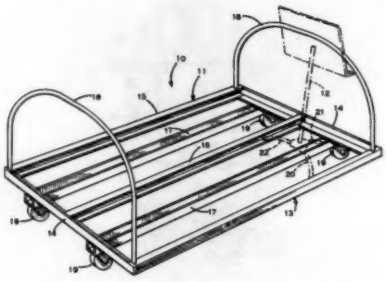


A separate stand for a bicycle comprising an elongated member, having a transverse hook at one end thereof, a bent out leg, at the opposite end, and a crank housing offset intermediate the ends of the member, and a stiffening member secured to the elongated member adjacent the hook and also adjacent the bend of the leg, said stiffening member also including a like crank housing supporting offset, and an appositely bent leg.

3,712,638
CONVEYANCE FOR TRANSPORTING OBJECTS WITH PROTRUDING LEGS

Frederick C. Lipinsky, 1424 North Penetaquit Avenue, Bay Shore, N.Y.

Continuation-in-part of Ser. No. 862,187, Sept. 30, 1969, abandoned. This application Sept. 16, 1970, Ser. No. 72,572
Int. Cl. B62b *5/00*
U.S. Cl. 280—79.1 **3 Claims**

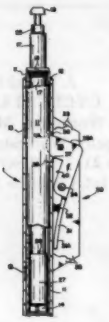


A conveyance for transporting similar, multi-legged objects nested together with their legs received and secured by a retainer structure upon a moveable carriage.

3,712,639
EXTENSIBLE BUNK STAKE FOR LOG TRUCKS

John E. Rysdam, II, Route 1 Box 8A, Elgin, Oreg.

Filed Dec. 31, 1970, Ser. No. 103,117
Int. Cl. B60p *7/06*
U.S. Cl. 280—146 **3 Claims**



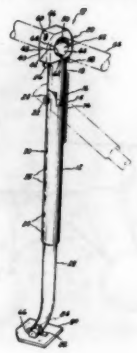
A bunk stake for the retention of logs on a logging truck and trailer with the stake having an extension normally telescopically received within the bunk state. The upper end of the extension is adapted for engagement with the log or like article being loaded for purposes of extracting the extension into a raised, locked position. Latch means are provided to retain the extension in a raised position and to permit convenient retraction by the truck operator of the extension.

3,712,640
MOTORCYCLE KICKSTAND

David E. Shipman, 6160 Grove Avenue; Robert C. Bunker, 3717 Longdale, both of Flint, Mich., and William Bunker, 6649 Branch Road, Flint, Mich.

Filed June 9, 1971, Ser. No. 151,297
Int. Cl. B62h *1/02*
U.S. Cl. 280—301 **8 Claims**

A kickstand for attachment to a frame of a motorcycle or the like and of the type adapted to swing selectively into a first position along the side of the motorcycle and to a second position extending downwardly from one side of the frame to contact the ground so as to support the motorcycle frame in an upright position. The kickstand includes a tubular member having one end releasably clamped to the motorcycle frame,

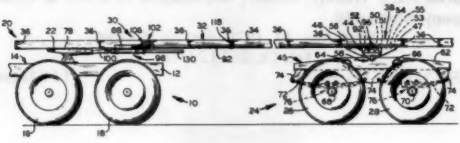


while the other end telescopically engages a support rod which is positionally adjustable along the length of the tubular member such that the overall kickstand length may be longitudinally adjusted for use with motorcycles of varying sizes. The kickstand includes a novel theft prevention clamping device.

3,712,641
STEERING SYSTEM FOR TRAILERS

Donald W. Sherman, Orchard Lake, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Nov. 17, 1971, Ser. No. 199,607
Int. Cl. B62d *53/00*
U.S. Cl. 280—426 **6 Claims**



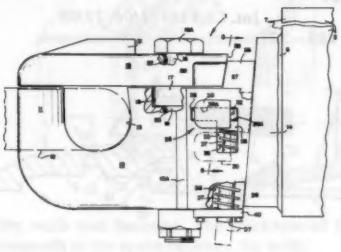
An improved steering system for use in a tractor-trailer combination wherein spaced parallel longitudinally extending links interconnect a first transversely extending control arm pivotally connected to the front of the trailer to a second transversely extending control arm cooperating with a steerable tandem axle assembly supporting the rear of the trailer with a limiting connection provided between the fifth wheel of the tractor and the first transversely extending control arm to effect initial simultaneous turning of the tractor and trailer axle up to a predetermined degree of relative movement between the tractor and trailer and subsequently allowing the tractor to turn in relation to the trailer beyond this point without effecting greater steering movement of the trailer axle. The limiting connection comprises a pair of force transferring members in the form of a housing secured to the underside of the first transversely extending control arm and a rod telescopically received in the housing with the latter being operatively connected to an actuating or steering member engageable in the V-slot of the fifth wheel so as to be unitarily rotatable therewith.

3,712,642

HITCH FOR LOG TRUCK TRAILERS

Elvin O. Burroughs, Route 2, Box 207, Dexter, Oreg.

Filed July 21, 1971, Ser. No. 164,615
Int. Cl. B60d 1/04
U.S. Cl. 280—504 7 Claims



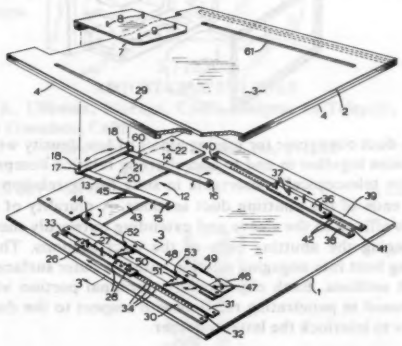
A hitch for truck and trailer wherein the locking member swingably moves in an arcuate manner to lock and unlock a trailer carried eye in place on a post member of the hitch. A latch plate is vertically positionable to engage one end of the locking member to retain same against horizontal, opening movement. The latch plate is urged downwardly into surfacial, abutting contact with the locking member while additional means associated with the latch plate permits downward movement of same into a releasing position permitting swinging movement of the locking member. A lug on the locking members retains the latch plate in a retracted position and the locking member open during a coupling operation to prevent coupling damage to both said plate and locking member.

3,712,643

MANIFOLDING OR COPYING APPARATUS

Francis Peter McKernan, Toronto, Ontario, Canada, assignor to Kemi Corporation Limited, Toronto, Ontario, Canada

Filed Aug. 24, 1970, Ser. No. 66,535
Int. Cl. B41l 3/10
U.S. Cl. 282—29 B 4 Claims



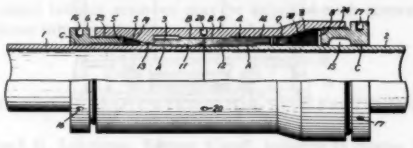
In a manifolding or copying apparatus of the kind used in wages systems and like invoicing systems, a first carrier and a second carrier for locating first and second data sheets on which duplicate entries have to be made are interconnected by a mechanism including a parallel linkage connected to the first carrier, a spring-biassed cam engageable by the parallel linkage, a reciprocating mechanism connected to the cam, and a ratchet mechanism actuated by the reciprocating mechanism and connected to the second carrier for advancing the latter stepwise in accordance with return movement of the first carrier to an initial position. Each carrier is constrained to move along a predetermined path and has a plurality of discrete operative positions. The apparatus may include a third carrier for the location of a third data sheet in registering relation with the first and second sheets.

3,712,644

CONNECTOR FOR A MILLIMETER WAVEGUIDE

Atsushi Hara, Tokyo; Hisao Naganuma, and Akio Takai, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1971, Ser. No. 146,321
Claims priority, application Japan, May 25, 1970, 45/50260
Int. Cl. F16l 19/02
U.S. Cl. 285—39 4 Claims



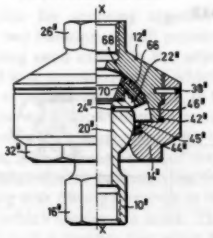
A connector for millimeter or other types waveguides, wherein packing material and push rings are firmly disposed between connecting sleeve and waveguides with spacer rings provided between the connecting sleeve and waveguides. Alignment of the waveguides is effected at the time of connection. The interconnecting surfaces of the parts are superfine finished so that tolerances are met and bending amount at the connecting parts is kept minimal.

3,712,645

BALL AND SOCKET PIPE JOINT

Martin Herter, Uhlandstrasse 74, 5 Koln 41, Germany

Filed Aug. 31, 1970, Ser. No. 68,220
Claims priority, application Germany, Sept. 8, 1969, P 19 45 523.3
Int. Cl. F16l 17/00
U.S. Cl. 285—95 7 Claims



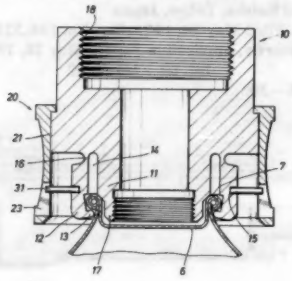
A pipe joint with a ball socket, a ball pin, and a socket nut for connecting the socket and pin together. The fluid passage extending axially through the ball socket and ball pin are sealed against leakage around the socket nut by packing rings. The end of the ball pin that is received in the ball socket is flared outwardly to allow for angular movement of the pin relative to the socket. The existance of a seal between the flared end of the pin and the socket causes a pressure differential urging the ball and socket to move apart. In order to overcome this danger, a channel extends from the flow passage in the ball pin to the area between the socket and the pin to reduce the pressure differential tending to cause separation of the elements in the joint.

3,712,646

QUICK COUPLING DEVICE FOR LPG CONTAINERS

Jean-Claude Bergougnoux, Levallois-Perret, France, assignor to Shell Oil Company, New York, N.Y.

Filed Dec. 21, 1970, Ser. No. 99,991
Claims priority, application France, Dec. 23, 1969, 6944586
Int. Cl. F16l 37/12
U.S. Cl. 285—315 5 Claims



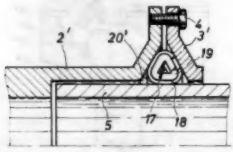
A coupling device for mounting appliances such as camp stoves gas lamps on compressed gas containers of the type having an opening surrounded by a circular projecting fold. The device comprises a hollow member equipped at one end with a number of fingers, and a sleeve, which may be displaced vertically along this hollow member. This sleeve in its lower position presses the fingers against the fold and is blocked in this lower position either by means of two semi-circular springs which co-operate with a special shaped slit in the sleeve or by means of special fingers which block the sleeve.

3,712,647

PIPE CONNECTION

Friedhelm Stecher, Burscheid, Germany, assignor to Goetzewerke Friedrich Goetze AG, Burscheid, Germany

Filed Nov. 24, 1970, Ser. No. 92,407
Claims priority, application Germany, Nov. 28, 1969, P 19 59 666.8
Int. Cl. F16l 39/00
U.S. Cl. 285—318 4 Claims



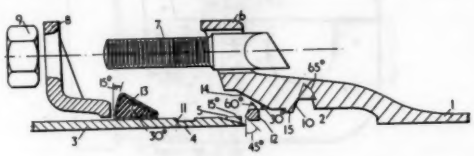
A releasable pipe connection has a pair of pipe ends engaging in one another so that one pipe end acts as a sleeve for the other pipe end. Once together, the pipe ends define a wedge-shaped groove. An annular helical coiled spring is arranged in the groove so as to serve as a clamping ring, and a flange ring is fastened to the one part and acts as a sleeve to clamp the helical coiled spring in the groove. The coils of the helical coiled spring may have circular or non-circular cross sections, and may be used in conjenction with a separate sealing ring, or may serve as a combination sealing and clamping ring by being provided with at least a partial jacket constructed from a suitable material.

3,712,648

SELF-ANCHORABLE PIPE JOINT

Norman John Clifford, Beeston, England, assignor to British Steel Corporation, London, England

Filed Aug. 17, 1970, Ser. No. 64,236
Claims priority, application Great Britain, Sept. 10, 1969, 44,689/69
Int. Cl. F16l 21/06, 21/08
U.S. Cl. 285—321 3 Claims



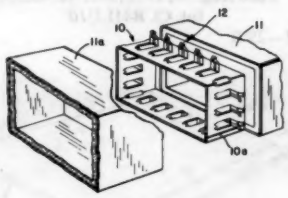
In self-anchorable pipe joints, of the kind in which a spigot at the end of one pipe is inserted into a socket at the end of the other pipe, a sealing member of tapered cross-section is placed under axial compression in the annular gap between the spigot and socket, the outer, transverse face of the sealing member is initially inclined relative to the axis of the sealing member. There is also provided an annular self-anchorable member for use in a self-anchorable pipe joint, having an anchoring face at about 60° to its axis. A pipe joint as disclosed is more resistant to leakage on angular misalignment than previous joints.

3,712,649

APPARATUS FOR SUPPORTING AND RETAINING LOW DENSITY WEBS

Duane Paul Martin, 7301 James Avenue South, Minneapolis, Minn.

Filed Oct. 11, 1965, Ser. No. 494,561
Int. Cl. F16l 53/00
U.S. Cl. 285—397 1 Claim



A duct connector for joining a pair of low density web duct sections together in end to end abutting relation comprising a sleeve telescopically insertable in snug fitting relation within the ends of the abutting duct sections. A plurality of similar clips affixed to the sleeve and extending outwardly therefrom engaging the abutting ends of the duct sections. The clips being bent into engaging relation with the outer surface of the duct sections. Each clip having a terminal portion which is disposed in penetrating relation with respect to the duct sections to interlock the latter together.

3,712,650

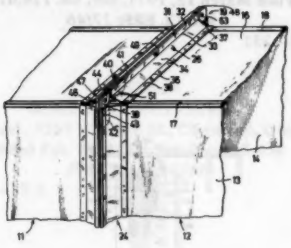
FLANGE CONNECTION FOR AIRCONDITIONING DUCTS

Georg Mez, Gartenstrasse 30A, 7416 Gonningen, Germany

Filed Dec. 10, 1970, Ser. No. 96,746
Claims priority, application Germany, Dec. 10, 1969, G 69 47 793.6; July 9, 1970, P 20 34 005.0
Int. Cl. F16l 23/00
U.S. Cl. 285—405 7 Claims

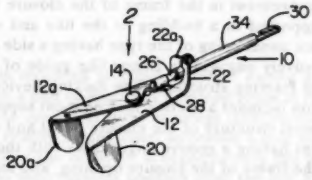
A four-sided flange is slidable and fastened over the free end of a sheet metal duct. The flange is hollow and has a pair

of parallel walls perpendicular to the duct. A solid angle piece is insertable at each corner of the flange into the space



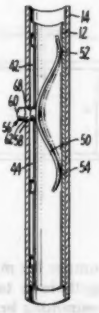
between the walls and fastened. The thickness of the angle piece corresponds to the space between the walls.

3,712,651
KNOT TYING DEVICE
Phillip B. Shockley, 3553 Vineland Ave., Baldwin Park, Calif.
Filed March 10, 1972, Ser. No. 233,514
Int. Cl. D03j *3/00*
U.S. Cl. 289—17 **6 Claims**



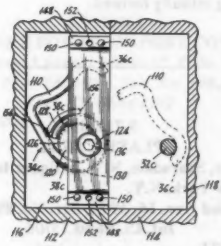
Knot tying device for fisherman characterized by a pair of resiliently closed jaws for holding hooks and other devices, or a line, while loops in a line are being formed around a tube slideable on a rod having an eye at one end with a slot therein. When the tube closes the slot the loops may be stripped across the rod eye which then pulls the free end of the line beneath the loops.

3,712,652
ADJUSTABLE SKI POLE
John K. Uilkema, Moraga, Calif., assignor to Telepole, Inc., San Francisco, Calif.
Filed April 10, 1970, Ser. No. 27,215
Int. Cl. F16b *7/10*
U.S. Cl. 287—58 CT **4 Claims**



An improved locking mechanism for selectively securing telescoping inner and outer tubular members of an adjustable ski pole at different composite lengths. The inner tubular member has formed therein an aperture extending along or portion of the length thereof and comprising a plurality of enlarged throughbores interconnected by slots. A spring-biased detent pin projects outwardly through said aperture and into a single hole formed in the outer tubular member. The detent pin includes an enlarged base portion having a necked-down portion extending outwardly therefrom. The associated spring, which is disposed within the inner tubular member, normally urges the detent pin outwardly with respect to the tubular members so that the enlarged base portion thereof is disposed within one of said inner tubular member enlarged throughbores to prevent the pin from moving in said aperture axially along said inner tubular member. Upon depression of the detent pin the necked-down portion thereof is placed in alignment with the inner tubular member wall defining the aperture so that the detent pin may slide within said slots and said outer tubular member may be adjusted with respect to said inner tubular member.

3,712,653
ECCENTRIC-ACTUATED HOOK-TYPE FASTENING DEVICE
Kenneth G. Lehmann, Easton, Conn., assignor to Norco, Inc., Town of Ridgefield, County of Fairfield, Conn.
Filed May 10, 1971, Ser. No. 141,844
Int. Cl. F16b *5/00*
U.S. Cl. 287—20.924 **8 Claims**



A fastening device for securing together two adjoining structures, such as two building or wall panels which have adjoining edges abutting each other. In the adjoining edges the panels are provided with recesses, one of which has a cross bar constituting a part of the fastening means. In the other recess there is movably carried a hook adapted to extend across the juncture of the panels for engagement with the cross bar to latch onto the same. The swivel portion of the hook is formed in the shape of a large eye or bearing ring, in which there is located an operating disk having bearings in the opposite side walls of the recess which carries the hook. The disk is eccentrically mounted in such a manner that when it turns it will effect an advancing and retracting movement of the hook, and will also effect a rotary movement or excursion of the hook into or out of the adjoining recess of the other panel. The eccentric disk is of molded plastic and has an integral flange constituting a track and stop shoulder formation which is engageable with portions of the hook to effect the proper movements and positioning of the latter The molded disk has means engageable by a tool, such as a square or hexagonal section key, for the purpose of turning the disk so as to operate the hook for fastening or unfastening the panels.

ERRATUM

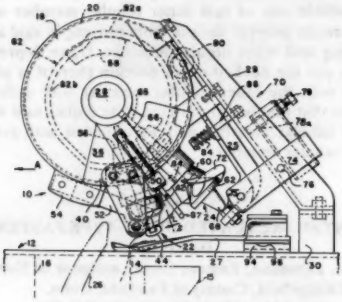
For Class 289—17 see:
Patent No. 3,712,651

3,712,654

KNOTTER MECHANISM HAVING A TWINE GUIDE COOPERATING WITH A BILL HOOK

Edwin B. Nolt, New Holland; Richard R. Eby, Ephrata, and Harry G. Eberly, New Holland, all of Pa.

Filed Oct. 13, 1971, Ser. No. 188,409
Int. Cl. A01d *59/04*
U.S. Cl. 289—2 17 Claims



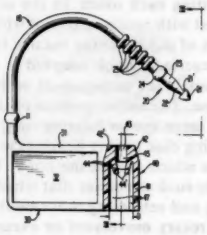
A knotter mechanism has a twine guide finger extending towards and overlapping with the bill hook for insuring that the leading strand of twine is positioned on the bill hook when the bale is being initially formed.

3,712,655

PLASTIC SEAL

Charles Fuehrer, Scarsdale, N.Y., assignor to Stoffel Steel Corporation, New York, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,542
Int. Cl. B65d *55/06*
U.S. Cl. 292—321 32 Claims



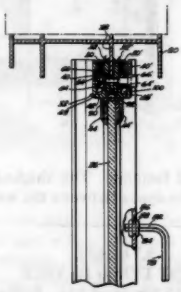
An all plastic seal in which the socket receiving the locking head of a strap connected to the seal body is provided with a housing open at both ends that is of such a ratio in its length to the opening in the housing at the end opposite where the locking head is inserted that access to the locking fingers is substantially precluded; additionally, the housing may be provided with inwardly projecting fluke-like projections minimizing the freedom of movement of the head in its locked condition in a direction transverse to the axial dimension of the housing.

3,712,656

LOCKING DEVICE FOR SLIDING CLOSURE

Walter E. Godshall, 14215 N.W. 17th Avenue, Miami, Fla.

Filed March 15, 1971, Ser. No. 124,011
Int. Cl. E05c *17/46*
U.S. Cl. 292—251 14 Claims



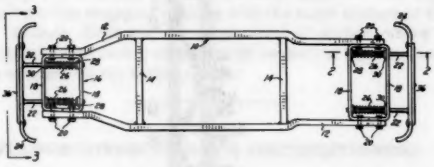
Locking structure for use in a sliding closure installation of the type having a movable closure panel guidingly constrained in adjustable movement in the frame of the closure opening stationarily supported in a building or the like and with the movable closure panel being of the type having a side channel member operatively engaging a flange-like guide of the stationary closure framing structure. The locking device of the instant invention includes a friction lock element supported in the guide channel structure of the closure panel and with the locking element having a groove engageable with the flange-like guide of the frame of the closure opening, and includes a threaded member operative upon bidirectional rotation to frictionally clamp and release the locking element and guide flange respectively in locking and releasing the sliding closure.

3,712,657

SHOCK ABSORBING BUMPER FOR MOTOR VEHICLES

Joseph P. Gallina, 6852 Steadman, Dearborn, Mich.

Filed June 8, 1971, Ser. No. 150,973
Int. Cl. B60r *19/06*
U.S. Cl. 293—86 1 Claim



A shock absorbing bumper for motor vehicles consisting of a transverse bar having thereon two laterally disposed rods slidably supported in a mounting bracket comprising a pair of oppositely disposed U shaped members. A coil spring on each of the two laterally disposed rods yieldably holds the transverse bar in an extended position. Such coil springs are

adapted to compress so as to permit the transverse bar to retract whenever a force of pre-selected magnitude is exerted upon it.

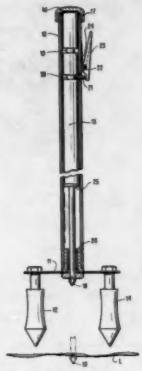
3,712,658
GOLF BALL RETRIEVING
Frank S. Yaresh, 3267 W. 82nd St., Cleveland, Ohio
Filed Feb. 24, 1971, Ser. No. 118,434
Int. Cl. A47f 13/06
U.S. Cl. 294—19 A 3 Claims

A pole mounted golf ball retriever having a coiled spring wire with a pair of angularly disposed loops at the end thereof which are spaced to form openings therebetween. The loops may be readily sprung apart to permit a golf ball to enter the openings as the retriever is urged toward the ball. The loops return to their original position after the ball has been effectively engaged.

3,712,659
IMPLEMENT HANDLE
Franz Kneissl, Kufstein, Austria, assignor to Franz Kneissl Skifabrik, Kufstein/Throl, Austria
Filed Sept. 21, 1970, Ser. No. 73,854
Claims priority, application Austria, Sept. 19, 1969, A 8903/69
Int. Cl. A01l 1/22
U.S. Cl. 294—57 1 Claim

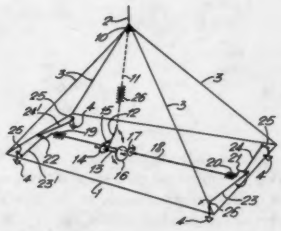
A handle for hand-held implements having a coating of synthetic material on a core member. The coating material may have reinforcing fibers or woven fabric, or both, worked into it in any shape which can be produced and in any desired or defined direction and position.

3,712,660
LITTER RETRIEVING DEVICE
Joseph L. Moore, Lexington, Ky., assignor to Moore Associates, Lexington, Ky.
Filed Nov. 15, 1971, Ser. No. 198,641
Int. Cl. B08b 1/00
U.S. Cl. 294—61 3 Claims



A hand held litter retrieving device selectively operable to pick up articles, such as glass bottles, without breaking the same, or to pickup puncturable articles, such as paper, is disclosed.

3,712,661
LIFTING YOKE FOR TRANSPORT CONTAINERS
Lewis Strand, Harald Lovenskiolsvei 37, Oslo, Norway
Filed Nov. 15, 1971, Ser. No. 198,697
Int. Cl. B66c 1/62
U.S. Cl. 294—67 DA 5 Claims

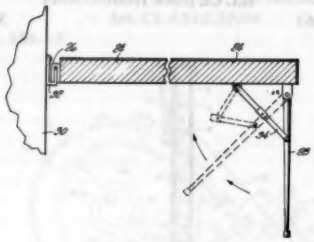


A lifting yoke for transport containers is disclosed. Connecting lugs rotatably mounted in the yoke frame may be rotated in steps of 90°, for example from a neutral position to a connecting position and vice versa by means of an elongated transmission element connected between the lifting cable and a ratchet mechanism drive coupled with the connecting lugs, the transmission element having such a length that it is tightened well before the lifting straps between the lifting cable and the yoke frame are tightened.

3,712,662
COLLAPSIBLE TABLE TRAILER
John T. Busby, Memphis, Tenn., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Aug. 25, 1971, Ser. No. 174,872
Int. Cl. B60p 3/32
U.S. Cl. 296—23 R 4 Claims

A trailer adapted to be pulled by an automobile or the like has a hollow dust proof carrying rack secured to the bottom of its frame with a table top having support means secured

thereto disposed removably therein. When the top is removed, on of its support means detachably engages a mating support

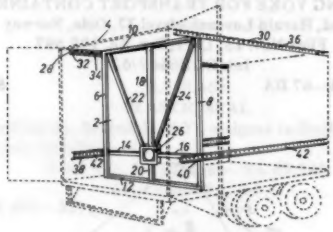


means on the outside surface of a trailer wall while another means constitutes a foldable leg which can be disposed vertically to hold the top in horizontal position for use.

3,712,663
BULKHEAD DOOR

Charles M. Laven, 67 Clive Avenue, Guelph, Ontario, Canada

Filed July 2, 1971, Ser. No. 159,445
Claims priority, application Canada, July 9, 1970, 87,799
Int. Cl. B60p 7/14
U.S. Cl. 296—24 **11 Claims**



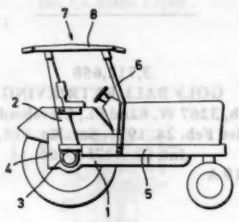
A bulkhead door adapted to be mounted within a container transversely of the side walls thereof and to be suspended from tracks which extend longitudinally of the container. The door is adapted to be suspended at its upper end by means of pinions mounted on and rotatable with a shaft extending transversely of the door and adapted to engage pinion racks extending longitudinally along the opposed side walls of the container. The door is provided with a three point locking system which includes a pair of locking members adapted to be projected from the sides of the door into apertured tracks which extend in spaced relationship parallel to the suspension pinion racks and a third locking member which, when projected, serves to prevent rotation of the transversely extending shaft and thus of the pinion racks.

3,712,664
TRACTOR CAB

Oswald May, Bonn, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany

Filed Sept. 16, 1970, Ser. No. 72,687
Claims priority, application Germany, Sept. 25, 1969, P 19 48 395.5
Int. Cl. B62d 25/06
U.S. Cl. 296—102 **9 Claims**

A tractor cab with a detachable roof section which is connected to upwardly extending arms of a safety device designed to protect the tractor driver in case of overturn of the tractor,

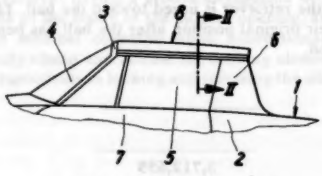


said roof section having a hollow profile filled with foamed synthetic material.

3,712,665
LOCK FOR A REMOVABLE ROOF ATTACHMENT FOR VEHICLES

Norbert Klein, 703 Boblingen, Germany, assignor to Firma Dr.-Ing. h. c. F. Porsche K. G., Stuttgart-Zuffenhausen, Germany

Filed March 4, 1970, Ser. No. 16,330
Claims priority, application Germany, March 6, 1969, P 19 11 379.2
Int. Cl. B60j 7/16
U.S. Cl. 296—137 R **31 Claims**



A lock for a removable roof attachment of vehicles, especially automotive vehicles, which is clamped against a fixed superstructure such as the roll yoke and wherein the lock cooperates with the removable roof attachment by way of a lever system articulated to a bearing plate. The lever system includes a handle and clamping element and is operative about pivot pins which are parallel to the longitudinal plane of the vehicle. The clamping element cooperates with an elastic member arranged at the roof attachment. The clamping element automatically pivots into a rest position by means of a spring element after releasing the handle. The bearing plate has a V-shaped portion for fixing the clamping element in the rest position.

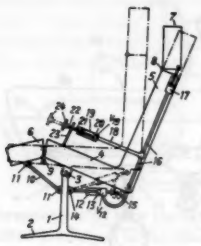
3,712,666
CHAIR

Martin Stoll, Tiengen, Germany, assignor to Giroflex-Entwicklungs, AG, Koblenz, Switzerland

Filed Dec. 16, 1970, Ser. No. 98,579
Claims priority, application Switzerland, Dec. 17, 1969, 18736/69
Int. Cl. A47c 1/036
U.S. Cl. 297—61 **9 Claims**

Chair having tiltable rigidly interconnected seat and back portions with the front edge of the seat portion being tiltable during backward tilting movement towards an inclined position for an increased leg comfort and provided with a head

support pivotally mounted to the top of the back portion together with means for automatically tilting the head support



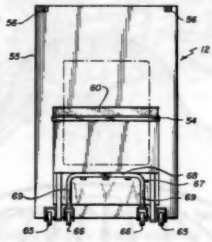
forwardly as the chair is moved towards a reclining position to maintain the head erect and means for selectively rendering the automatic head support rotating means inoperative.

3,712,667

CONSOLE-CHAIR COMBINATION

Albert C. Weber, 600 Glen Ridge Drive, Glenview, Ill.

Filed March 25, 1971, Ser. No. 128,086
Int. Cl. A47b *83/00*
U.S. Cl. 297—140 7 Claims



A console and chair combination, particularly suited for use as a sewing machine cabinet wherein the chair may be conveniently nested within the console, lock means provided to lock the chair when nested within the console, and a castering system to enable the chair and console combination to be moved as a unit when the chair has been nested and locked within the console.

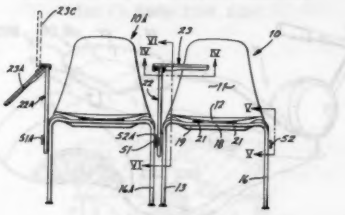
3,712,668

STACKABLE CHAIR WITH FOLDABLE TABLET ARM

Roy W. Fink, Portage, Mich., assignor to The Vecta Group, Inc., Kalamazoo, Mich.

Filed Jan. 21, 1971, Ser. No. 108,511
Int. Cl. A47b *3/04*; A47c *39/06*
U.S. Cl. 297—162 8 Claims

A stackable and gangable chair having a folding tablet arm movable between a horizontal position disposed directly above a portion of the chair seat and a downwardly and outwardly sloping position located sidewardly of said seat. The tablet arm is mounted upon upwardly diverging support elements connected to legs on one side of said seat. The legs, which are rigidly secured to the seat, have front and rear pairs which diverge downwardly. Ganging members are rigidly connected either directly or indirectly to the legs on both sides of the seat. The ganging members and the support elements are arranged so that one of said chairs can be nested on top of



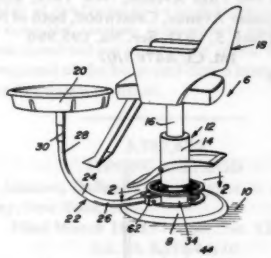
another of said chairs when their tablet arms are in their outwardly and downwardly sloping positions.

3,712,669

CHAIR ATTACHED BEAUTICIANS TRAY

Cash J. Cates, 207 Harn Street, Monroe, La.

Filed Oct. 9, 1970, Ser. No. 79,543
Int. Cl. A47c *7/62*
U.S. Cl. 297—188 5 Claims



An adjustable and rotatable chair structure of a type currently used in beauty salons and a self-contained attachment therefor comprising a multipurpose tray, an L-shaped or an equivalent elevating and supporting arm for the tray having a vertical upper end portion atop which the tray is mounted, and a horizontal lower end portion, means by way of which the lower end portion is operatively connected with a suitable predetermined part of said chair, for example, the usual pedestal.

3,712,670

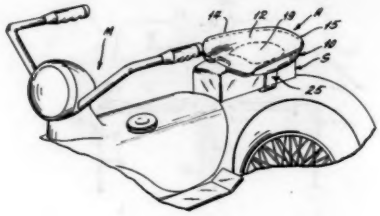
ACCESSORY ATTACHMENTS FOR MOTORCYCLES AND THE LIKE

Paul W. Svehla, 3985 LaCrescenta Road, El Sobrante, Calif., and Samuel R. McQuisten, 933 Oxford Street, Berkeley, Calif.

Filed July 15, 1971, Ser. No. 162,877
Int. Cl. B62j *1/00*; A47c *1/08*
U.S. Cl. 297—195 18 Claims

An accessory seat attachment for removable securement to two-wheeled motor vehicles, such as motorcycles and the like. The seat attachment is formed of a frame member which somewhat conforms to the buttocks of the human body when in the seated position. The frame is provided with an enlarged aperture in the region which would be capable of engaging the buttocks of a human body and a foam-like cushion is secured

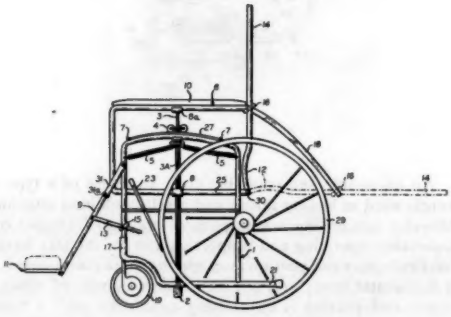
to the frame and completely covers the enlarged aperture in the shell. The plastic shell is also provided with a pair of elongated slots for accommodating hooks which are engageable with the vehicle for removably securing the seat attachment to the vehicle.



3,712,671
FOLDING, ROCKING, POSTURE ADJUSTING WHEEL CHAIR

John E. Dalton, 1140 Fifth Avenue, New York, and Victoria Lia, 424 Westchester Avenue, Crestwood, both of N.Y.

Filed Nov. 5, 1971, Ser. No. 195,990
Int. Cl. A47c *3/02*
U.S. Cl. 297—258 8 Claims



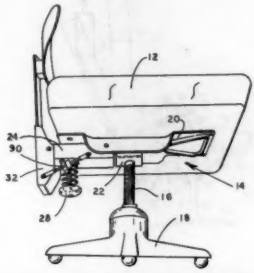
The rocking component is pivotally mounted by the upstanding flexible steel rods on the wheel frame and is guided by means of pairs of guide wheels which roll on the upper horizontal curved rail bar of the wheel frame. The foot rest is adjustable relative to the floor level and is pivotal in two directions so as to be folded up into a vertical position and then pivoted backward into the chair frame.

3,712,672
CHAIR IRON AND MOUNTING PLATE THEREFOR

Clare J. De Graaf, Grand Rapids, Mich., assignor to Gordon Manufacturing Co., Grand Rapids, Mich.

Filed March 8, 1971, Ser. No. 121,789
Int. Cl. A47c *1/023*
U.S. Cl. 297—306 9 Claims

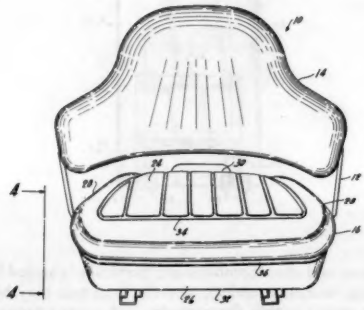
A chair iron having a one piece mounting plate with rigid downwardly extending ears which rigidly mount a spindle bracket and pivotably mount a back rest yoke. The integrally formed mounting plate reduces material costs, weight of the chair iron, and manufacturing costs.



3,712,673
RESILIENT SEAT CUSHION WITH CREASE-PREVENTING MEANS

Richard F. Swenson, Milwaukee, Wis., assignor to Swenson Corporation, Red Granite, Wis.

Filed Jan. 27, 1972, Ser. No. 221,285
Int. Cl. A47c *7/22*; B60n *1/06*
U.S. Cl. 297—452 16 Claims



A resilient seat cushion having a top surface and one or more side surfaces which tend to deform when the seat cushion is subjected to compressive force, comprising a resilient compressible body and a flexible cover which adheres to the body. The side surface or surfaces are provided with one or more indentations which are permanently formed in the cover and the body and are disposed transversely to the direction of the compressive force and prevent permanent deformation, wrinkling or creasing of the side surface.

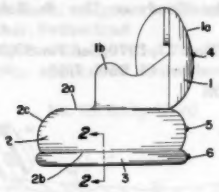
3,712,674
INFLATABLE CHAIR

Sutematsu Ando, Tokyo, Japan, assignor to Century Products, Inc., Cleveland, Ohio

Filed April 19, 1971, Ser. No. 135,033
Int. Cl. A47c *27/08*, *27/18*
U.S. Cl. 297—456 6 Claims

An inflatable chair is provided, consisting of a plurality of separately inflatable portions or sections, and which is so con-

structed as to adhere to the floor by the suction of a portion of the chair against the floor, to thereby provide excellent stabili-



ty of the chair, irrespective of how the weight of an occupant of the chair is shifted in relation to the chair.

3,712,675

PORTABLE DUMP BOX

Goenter Schoenwald, 10516-77th Avenue, Edmonton, Alberta, Canada

Filed June 7, 1971, Ser. No. 150,409
Claims priority, application Canada, May 31, 1971, 114408
Int. Cl. B60p *1/16*
U.S. Cl. 298—10 8 Claims

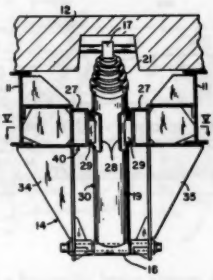
A portable dump box which serves as a temporary storage facility in the gathering of pay loads such as forage or snow is described. This apparatus has a levelling mechanism which interacts with its tilting mechanism and ensures that its frame remains level during both tilting and towing operations. The invention comprises a wheeled carriage including an axle having wheels rotatably mounted at opposite ends thereof, a frame, a dump box, means for tilting the dump box and means for maintaining the frame level. The axle is below and pivotably moveable relative to the frame about the longitudinal axis of the carriage. The dump box is hingedly joined to the frame along a longitudinal edge thereof at a point of the frame remote from the ground. The means for tilting the dump box comprises at least one hydraulic jack positioned to pivot the dump box on a hinged joint about an axis longitudinal to said frame. The means for maintaining the frame level comprises a pair of hydraulic jacks, a first member of each jack being fixed to the frame at or near opposite longitudinally extending edges thereof, a second member of each jack being fixed to the axle or at near opposite ends thereof, a hydraulic fluid line extending from one jack to the other, whereby an upward action on the first element in one jack produces a downward reaction in the second element of the other jack. There are valve means in the hydraulic fluid line having an open position permitting two-way flow of fluid and a closed position permitting no flow of fluid, the valve means being in the open position when the dump box is at rest and in the closed position during substantially the entire tilting operation.

3,712,676

SEMI-TRAILER DUMP BODY CONSTRUCTION

Arthur C. Benninger, Seneca, and Meletus I. Long, Brookville, both of Pa., assignors to Tri-Brook, Inc., Brookville, Pa.

Filed Dec. 10, 1971, Ser. No. 206,832
Int. Cl. B60p *1/04*, *1/28*
U.S. Cl. 298—22 R 3 Claims



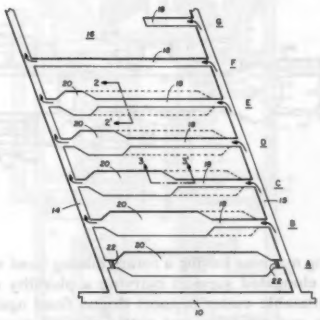
A semi-trailer dump body construction affording improved lateral stability during dumping in which a hydraulic hoist is mounted below the dump body and support frame, positioned intermediate the fifth wheel connection and the tandem rear axle assembly of the frame so as to distribute the loading more uniformly over the tandem rear wheels and including alignment means mounted on either side of the hoist to minimize lateral movement of the hoist and dump body when the hoist is in the extended dump position.

3,712,677

MINING METHOD

Albert T. Janssen, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed March 10, 1971, Ser. No. 122,927
Int. Cl. E21c *41/10*
U.S. Cl. 299—13 10 Claims

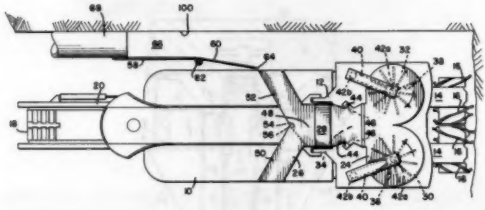


A chamber mining technique whereby a series of horizontal slopes are formed between haulage and bleeder entries. Upon completion of a crosscut, the top and sides are drilled and blasted in a retreat operation and the broken ore is hauled out. The mined-out area need not be entered and there is no need for support or scaling since failure of walls between stopes will at no time endanger men and equipment.

3,712,678
MINING MACHINE HAVING DUST COLLECTING MEANS

Michael J. Amoroso, Pittsburgh, Pa., assignor to Lee-Noise Company, Charleroi, Pa.

Filed March 18, 1971, Ser. No. 125,601
Int. Cl. E21c 27/24
U.S. Cl. 299—68 24 Claims

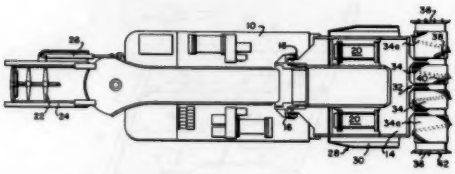


A continuous miner which is provided with dust collecting means comprising boom carried ducting adapted to receive dust entraining air adjacent and rearwardly of the mining head, and chassis carried ducting operable to alternatively discharge the air to opposite sides of the machine. Contrarotating centrifugal fans mounted in the boom carried ducting draw dust entraining air to such ducting whereby the air flows therethrough to the chassis carried ducting; and scrubbers or cleaners are operatively associated with the boom carried ducting for removing larger dust particles from the air flowing through the latter.

3,712,679
MINING MACHINE HAVING ADJUSTABLE LENGTH CUTTING DRUM

Michael J. Amoroso, Pittsburgh, Pa., assignor to Lee-Noise Company, Charleroi, Pa.

Filed Dec. 21, 1970, Ser. No. 100,042
Int. Cl. E21c 27/24
U.S. Cl. 299—76 24 Claims

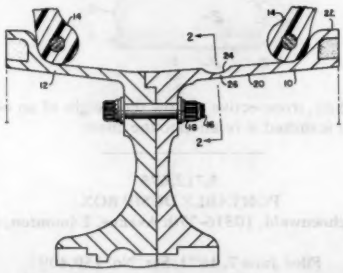


A mining machine having a rotary mining head which comprises an elongated support carrying a plurality of laterally spaced, rotatable cutter support drums fixed against lateral movement and rotatable end cutter support drums laterally movable to vary the length of the mining head by separate pistons in cylinder means contained in the support. The first mentioned drums carry cutter bits arranged to cut along the therebetween spaces thereby avoiding the necessity for cutter chains or other auxiliary cutting or breaking means therebetween; and the drums are rotatably driven by a pair of drive motors through clutchless interconnecting means including intermeshing gears in the mining head on non-parallel axes.

3,712,680
VEHICLE WHEEL WITH FAIL SAFE FEATURES

William P. Hyland, Cuyahoga Falls, Ohio; Roy W. Baird, Akron, Ohio, and James A. Culbertson, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 27, 1970, Ser. No. 93,270
Int. Cl. B60b 3/08
U.S. Cl. 301—63 DS 4 Claims

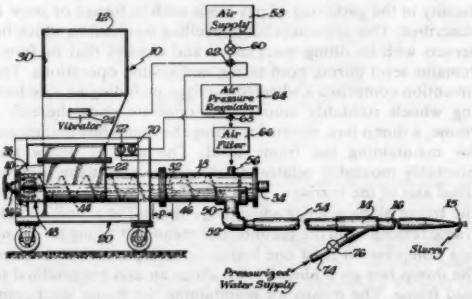


A localized area of reduced thickness is provided on a vehicle wheel. One side of the localized area is exposed to tire inflation pressure while the other side of the area is exposed to atmospheric pressure. The area is located at the region in which the likelihood of crack propagation through the section due to fatigue failure of the wheel is at a maximum and circumferential propagation of a failure is at a minimum. The thickness of the reduced area is determined from the wheel characteristic so that a crack failure will occur at the localized area, resulting in a gradual release of pressure from the tire, before circumferential failure occurs.

3,712,681
PNEUMATIC CONVEYING APPARATUS FOR LIGHT MATERIAL

Joseph J. Marino, Ridgefield, and Raymond J. Demaison, Old Greenwich, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 199,851
Int. Cl. B65g 53/04; B05b 7/06
U.S. Cl. 302—20 18 Claims



Light dry material, such as asbestos, fed through a tubular screw pneumatic conveyor forms a sealing plug against blowback in the free space between separated sections of the feed screw. The seal is consolidated by a restrictive orifice plate, which may be flexible, in the sealing plug zone having a passageway smaller than the tubular housing and larger than the shaft. The length of the sealing plug is varied by adjusting a spacing device connected to one of the screw sections to provide the most effective seal for a particular material. Variable spacing is provided, for example, by removable spacer plates or a movable flange which can be locked into one of many axial positions. The air-borne light material is mixed with water to form a slurry for application to a surface.

3,712,682

APPARATUS FOR FEEDING FIBER MATERIAL INTO A CHUTE

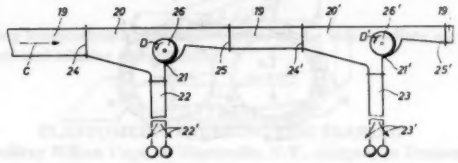
Rolf Binder, Raterschen, and Rudolf Wildbolz, Winterthur, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Nov. 10, 1969, Ser. No. 875,094

Claims priority, application Switzerland, Nov. 8, 1968, 16770/68

Int. Cl. B65g *53/40*

U.S. Cl. 302—28 22 Claims



The fiber material is directed onto one or more chutes from a pneumatic transporting duct by rotatable cylinders. Each chute has a cylinder associated therewith which at least partially interrupts the transporting air stream to intercept and direct a portion of the air flow and entrained fibers into the chute. The cylinders may be positively rotated or freely mounted. The cylinders are also mounted close to the back wall of the chute to allow removal of accumulations of fibers on the cylinders.

3,712,683

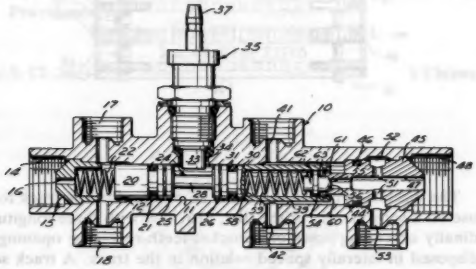
BRAKE WARNING SWITCH

Frederick D. Keady, Cleveland Heights, and Richard J. Silagy, Parma, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed March 11, 1970, Ser. No. 18,636

Int. Cl. B60t *17/22, 8/26, 11/34*

U.S. Cl. 303—6 C 10 Claims



A fluid pressure switch unit is disclosed for use in a motor vehicle dual hydraulic brake system having a front brake circuit and a rear brake circuit. The rear brake circuit includes a pressure reducing valve for preventing premature lock-up of the rear wheel brakes. A fluid pressure failure in the front circuit operates the switch unit to actuate a warning signal, and the valving mechanism includes a bypass opening in an insert member disposed in one end of a bore in the switch unit housing. The bypass opening is normally closed by a valve member which is slidably carried by the switch piston. Movement of the switch piston to actuate the warning device moves the valve member away from the bypass opening to bypass the pressure reducing valve and supply full pressure to the rear brakes. When the switch piston is returned to a centered position, the bypass opening is again closed by the valve member to return the proportioning valve to the circuit.

3,712,684

HYDRAULIC BRAKE SYSTEM FOR VEHICLES

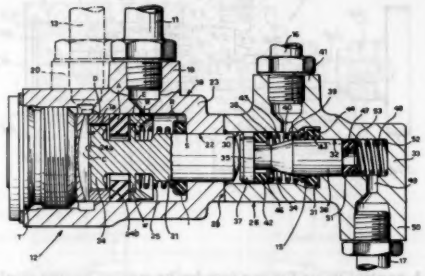
Ettore Cordiano, Turin, Italy, assignor to Fiat Societa per Azioni, Turin, Italy

Filed Feb. 4, 1971, Ser. No. 112,641

Claims priority, application Italy, Feb. 11, 1970, 67434 A/70

Int. Cl. B60t *8/18, 11/34*

U.S. Cl. 303—22 A 3 Claims



A vehicle with a hydraulic brake system and fluid levelling devices to compensate for variations in rear axle load is equipped with a pressure-reducing device to vary the braking pressure on the rear wheels. The pressure-reducing device is actuated by exerting force on a protruding stem. An actuator is provided to operate on the stem, comprising a cylinder in which two chambers are formed, each attached to a levelling device of a wheel. A rod with two piston slides sealingly in a wall dividing the chambers, projecting into both. The pistons have effective areas opposite the stem that are equal in area, so that the cumulative force of the actuating member on the stem varies with the rear axle load.

3,712,685

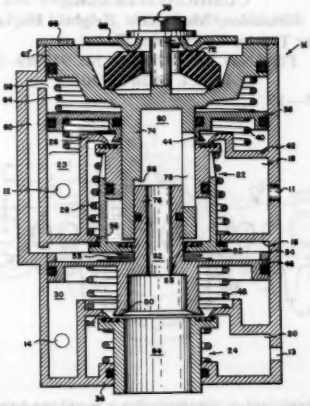
DUAL CIRCUIT BRAKE VALVE

David A. Hoffman, Olmsted Falls, Ohio, assignor to Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio

Filed Sept. 29, 1970, Ser. No. 76,489

Int. Cl. B60t *15/12*

U.S. Cl. 303—52 10 Claims

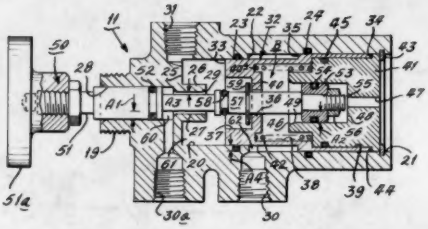


A dual circuit brake valve including first and second self-lapping valve elements for respectively controlling primary and secondary fluid pressure braking circuits, each of the valve elements being controlled by separate relay pistons subject to fluid pressure in one of said circuits and the supply of fluid pressure to the relay pistons being manually controlled through operation of a valve which is independent of the self-lapping valve elements.

3,712,686
CONTROL VALVE

Raymond J. Kersting, Dellwood, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Feb. 11, 1972, Ser. No. 225,521
Int. Cl. B60t 13/22
U.S. Cl. 303—71 27 Claims



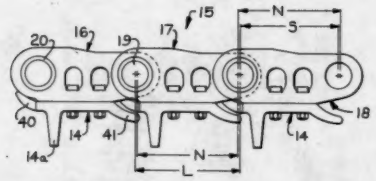
A control valve for use in a brake system having dual fluid pressure sources and a spring setting pressure released brake actuator is provided with selectively operable means movable between an applying position for applying said actuator fluid pressure supplied from one of said sources and a venting position for exhausting the applied fluid pressure from said actuator to effect spring setting actuation thereof, and resiliently urged means are provided to drive said selectively operable means to its venting position when the fluid pressure of the other source acting on said resiliently urged means is less than a predetermined value, said resiliently urged means including passage means for the exhausting passage therethrough of the applied fluid pressure when said selectively operable means is in its venting position.

This invention relates generally to control valves and in particular to push-pull type control valves for use in a fluid pressure system to control a spring setting pressure released brake actuator thereof.

3,712,687
DUAL PITCH TRACK LINKS FOR ADJUSTMENT OF CUSHIONED TRACKS

George F. Alexander, Marquette Heights, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 20, 1970, Ser. No. 91,489
Int. Cl. B62d 55/20
U.S. Cl. 305—19 10 Claims

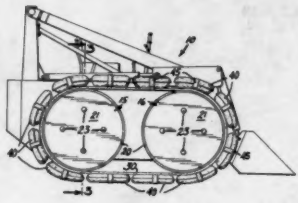


An adjustable track assembly for a cushioned track system comprising a plurality of shoe-bearing links, said track assembly being mounted circumferentially around a resilient spacer means. Some of said links in the track assembly have one pitch length and the others have a second pitch length. By coupling together a selected number of links of each pitch length, a closed track chain of any given circumferential length is obtained. The particular number of links of each length is conveniently determined by use of a nomogram.

3,712,688
MODIFICATION MEANS FOR CHANGING WHEELED VEHICLES TO ALL-TERRAIN VEHICLES

Kenneth M. Russell, 1070 Forestvale Lane, Helena, Mont.

Filed March 17, 1971, Ser. No. 125,308
Int. Cl. B62d 55/24
U.S. Cl. 305—34 5 Claims

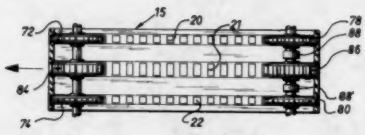


A cylindrical drum coaxially affixed to each wheel of a wheeled vehicle so as to rotate therewith, endless belts affixed in overlying relationship to the drums and tires fixedly attached in a flat orientation to the outer surface of the endless belts to provide support for the vehicle for substantially any terrain.

3,712,689
TRACK FOR SNOWMOBILE OR THE LIKE

Guy-Noel Chaumont, Tring-Jonction, Quebec, Canada, assignor to Poly-Traction Inc., Tri-Jonction, Quebec, Canada

Filed March 2, 1971, Ser. No. 120,157
Int. Cl. B62d 55/24
U.S. Cl. 305—38 9 Claims



The disclosure herein describes an endless flexible track for use on a snowmobile or the like, provided with three longitudinally extending rows of sprocket-teeth-receiving openings disposed in laterally spaced relation in the track. A track so constructed may now be used with various types of sprocket wheel arrangements; such a construction enables an anti-desynchronization effect on the idler sprocket wheels mounted on the rear axle of the snowmobile.

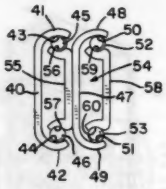
3,712,690
SLIDE STRUCTURE

Maxwell S. Fall, Indianapolis, Ind., assignor to Herbert S. Fall, Indianapolis, Ind.

Filed June 11, 1971, Ser. No. 152,257
Int. Cl. F16c 29/04
U.S. Cl. 308—3.8 6 Claims

A slide structure comprising two channel members and two bar members, each bar member being telescopically longitudinally slidably received within a separate channel member, two of said members, of which at least one is a channel member being fixedly secured together to constitute an inter-

mediate element, and the other two members being arranged respectively on opposite sides of the intermediate element and



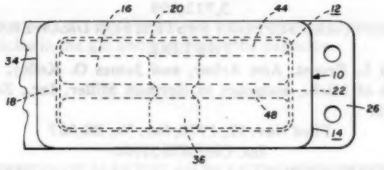
being longitudinally movable relative to the intermediate element and relative to each other.

3,712,691

ELASTOMERIC SNUBBING SIDE BEARING

Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 3, 1971, Ser. No. 112,156
Int. Cl. B61f 5/14; F16c 17/04; F16f 1/36
U.S. Cl. 308—138 7 Claims



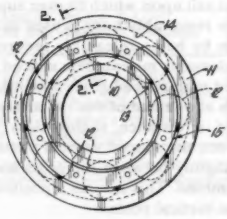
A resilient side bearing installable between a truck and body of a railway vehicle containing a housing and a cover, and elastomeric solids disposed in spaced segments within the housing and bearing upon the cover.

3,712,692

WELDED RETAINER FOR AN ANTIFRICTION BEARING

Ronald E. Restelli, Cromwell, Conn., assignor to Textron Inc., Providence, R.I.

Filed Jan. 18, 1971, Ser. No. 107,071
Int. Cl. F16c 33/46
U.S. Cl. 308—217 6 Claims



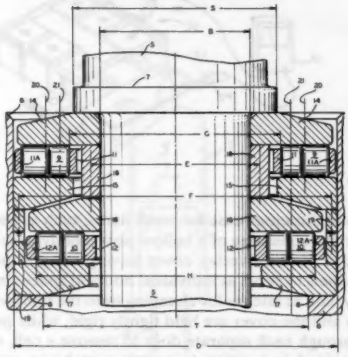
The invention contemplates a bearing retainer of the variety involving axially split mating ring elements or halves, in which pockets for holding individual antifriction elements are defined by matched recesses in each ring element, with abutting bridge formations between adjacent pockets. Axial bores at bridge locations receive locating rods which extend substantially the full axial length of the retainer. The rod ends are fusion-welded to adjacent bore material in such manner as to retain a compressionally loaded unison of the two mated ring elements or halves. The nature of the process is to permit retainer assembly as the final step of assembling the full bearing, complete with antifriction elements in grooved raceways, without danger to the operative bearing parts.

3,712,693

MULTIPLE STAGE THRUST BEARING

Lawrence E. Root, Jamesville; William J. Derner, Manlius, and Harold E. Stewart, Central Square, all of N.Y., assignors to Rollway Bearing Company, Inc., Syracuse, N.Y.

Filed April 22, 1971, Ser. No. 136,413
Int. Cl. F16c 19/10
U.S. Cl. 308—231 1 Claim



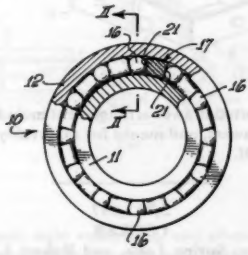
An improved multiple stage thrust bearing having a plurality of sets of thrust plates, all of the plates having controlled spring rates and being cantilever mounted to deflect under a thrust load. A roller complement is carried between the opposing faces of each thrust plate set, and a plurality of thrust transmitting ring members are located between all adjacent pairs of rotating and stationary thrust plates, to carry a portion of the load applied to the plates. In the bearing, preferentially selected elastic materials, predetermined design ratios, and congruency of load-deflection characteristics of the thrust plates and sleeves are utilized to achieve controlled displacement ratios at all bearing stages and to establish a predictable thrust bearing fatigue life.

3,712,694

ANTIFRICTION BEARING SPACER

Robert L. Smith, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed March 8, 1971, Ser. No. 121,906
Int. Cl. F16c 19/20
U.S. Cl. 308—199 9 Claims

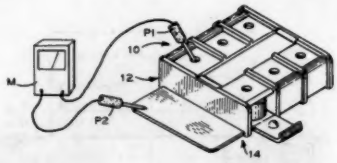


This bearing spacer is a substantially cylindrical body with rounded corners joining the end and cylindrical side walls. It has a critical diameter and length so that it properly spaces adjacent bearings and is free to slide and turn about its own longitudinal axis in the bearing races without any tendency to tip or cock. The spacer is composed of a relatively incompressible, high temperature resistant material which gradually transfers a film to the bearing for lubricating them at high temperatures.

3,712,695
HEARING AID BATTERY DISPENSER

Gordon E. Kaye, Irvington, N.Y., assignor to P. L. Mallory & Co., Inc., Indianapolis, Ind.

Filed April 7, 1971, Ser. No. 132,047
Int. Cl. A24f 25/00
U.S. Cl. 312—31 14 Claims

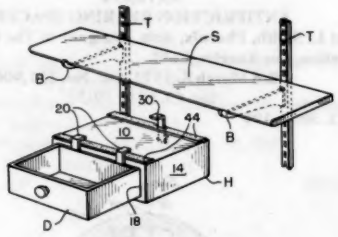


A plastic dispenser case for small items, such as hearing aid battery cells, consisting of a hollow plastic body to receive the cells and a plastic overlay cover having integral peripheral hinged panels to serve as individual doors to spaces in the hollow body, and as latches for clamping onto the hollow body, so the body and the cover are held tightly rigid, while permitting access through each separate door to remove a cell, with windows provided in position to permit a probe to engage one control terminal of a selected cell, with a sheet of dessicant material metallized on one surface to engage all the cell outer shells as the other terminal of the cells, for access as a common electrode by an external probe, thereby permitting testing of the individual cells in the dispenser case with the cells all assembled.

3,712,696
SHELF-SUPPORTED DRAWER ARRANGEMENT

Thomas M. McDonnell, 11 North 4th Avenue, Maywood, Ill.

Filed Aug. 2, 1971, Ser. No. 168,036
Int. Cl. A47b 91/00, 51/00; A47f 5/00
U.S. Cl. 312—253 2 Claims



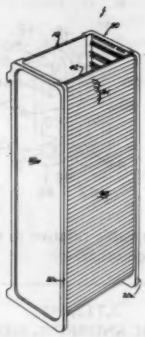
A shelf-supported drawer arrangement including a housing, one or more drawers, and means for removably attaching the housing to a shelf.

3,712,697
LOCKER

James O. Kelley, Spring Lake, and Robert L. Propst, Ann Arbor, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed June 2, 1971, Ser. No. 149,164
Int. Cl. E06b 9/14
U.S. Cl. 312—297 15 Claims

The sides of the locker include tracks in which a vertically sliding tambour door is mounted. The tracks are open at one end so that the tambour door can be removed. A cross piece can be inserted between the sides of the locker at the top of the locker and at the bottom thereof. Hinges can be snapped on to the cross pieces, and horizontal swinging doors can be mounted on the hinges. At least one of the hinges for each

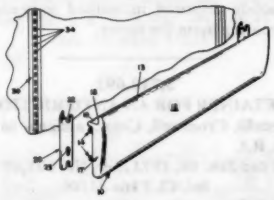


door has a catch which cooperates with a latch on the door so that the doors will stay closed.

3,712,698
STRUCTURAL SUPPORT SYSTEM FOR DRAWERS AND THE LIKE

Robert L. Propst, Ann Arbor, and James O. Kelley, Saline, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Nov. 12, 1970, Ser. No. 88,567
Int. Cl. A47b 51/00
U.S. Cl. 312—350 19 Claims



A horizontal rail upon which drawer supporting frames and the like can be removably hung is used in a vertical post supporting system by being releasably secured to clips which in turn can be releasably mounted on spaced, vertical posts. The rail is provided with spaced studs which key into slots in the clip. The studs at one end of the rail are spaced from those at the other end a distance slightly less than the operable distance between the spaced vertical posts such that the clips tend to bind slightly between the posts and the rail when the system is assembled. This insures a positive, tight fit between the rail and the vertical posts.

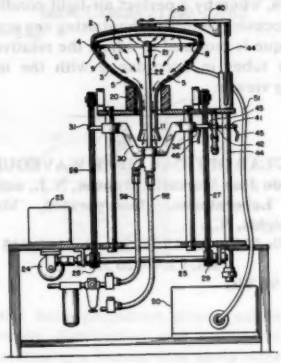
3,712,699
CHARGED PARTICLE REMOVAL APPARATUS FOR AN IMAGE DISPLAY DEVICE

Gerald T. Syster, Glen Ellyn, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 1, 1971, Ser. No. 177,076
Int. Cl. H01j 9/50
U.S. Cl. 316—2 6 Claims

An apparatus for removing charged particles from a conductive element of an image-display device comprises an alternating current high-voltage power supply, means connecting the alternating current high-voltage supply to the element to vary the potential of the element to diminish the electric

charge differential between the particles and the element and loosen the particles, and means for injecting a flushing gas into



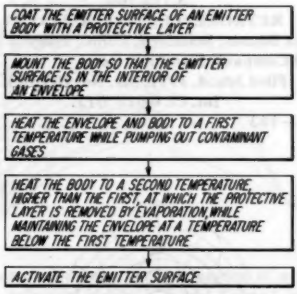
the device and circulating the gas under pressure to suspend the particles in the gas and to exhaust the particles.

3,712,700

METHOD OF MAKING AN ELECTRON EMITTER DEVICE

Alfred Hermann Sommer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 18, 1971, Ser. No. 107,372
Int. Cl. H01j 9/18
U.S. Cl. 316—19 4 Claims


COAT THE EMITTER SURFACE OF AN EMITTER BODY WITH A PROTECTIVE LAYER
MOUNT THE BODY SO THAT THE EMITTER SURFACE IS IN THE INTERIOR OF AN ENVELOPE
HEAT THE ENVELOPE AND BODY TO A FIRST TEMPERATURE WHILE PUMPING OUT CONTAMINANT GASES
HEAT THE BODY TO A SECOND TEMPERATURE, HIGHER THAN THE FIRST, AT WHICH THE PROTECTIVE LAYER IS REMOVED BY EVAPORATION, WHILE MAINTAINING THE ENVELOPE AT A TEMPERATURE BELOW THE FIRST TEMPERATURE
ACTIVATE THE EMITTER SURFACE

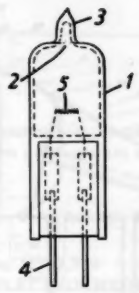
A method comprising coating an uncontaminated emitter surface of an emitter body with a non-contaminating protective layer and then mounting the body so that the coated surface is in the interior of an envelope. The envelope and body are then heated to a first temperature to drive contaminant gases from surfaces of the envelope interior while these gases are simultaneously pumped out. The first temperature is low enough that the protective layer remains. Then the body is heated to a second temperature, higher than the first, and the protective layer evaporated off the surface while the envelope is maintained at a temperature below the first temperature. Thereafter the emitter surface is activated by the application thereto of a material which lowers the work function.

3,712,701

ELECTRIC INCANDESCENT LAMPS

Robert Bernard Johnston, and John Michael Rees, both of London, England, assignors to British Lighting Industries Limited, London, England

Division of Ser. No. 1,404, Jan. 8, 1970. This application Aug. 27, 1971, Ser. No. 175,719
Int. Cl. H01j 9/38
U.S. Cl. 316—20 7 Claims



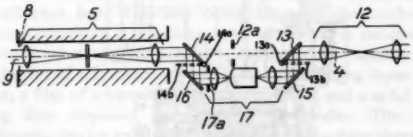
A tungsten-halogen cycle electric incandescent lamp has a fill including a phosphonitrilic halide. Mixtures of more than one of the halides may be employed. The halide can be introduced into the lamp envelope in solution, the solvent being evaporated thereafter to leave the halide as residue.

3,712,702

TELESCOPIC SIGHT FOR DAYLIGHT AND NIGHT OBSERVATION

Horst Schmidt, Wetzlar, Germany, assignor to Fa. Ernst Leitz GmbH, Wetzlar, Germany

Continuation of Ser. No. 691,836, Dec. 19, 1967, abandoned. This application Sept. 30, 1970, Ser. No. 77,053
Claims priority, application Germany, Dec. 21, 1966, L 55 323
Int. Cl. G02b 27/32
U.S. Cl. 350—10 1 Claim

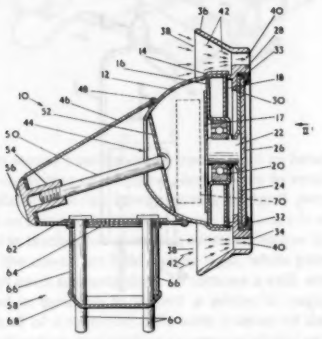


In a telescopic sight comprising two observation systems, one for use in daylight and one for use at night, means are provided for optically aligning either one of said observation systems with a light entry axis that is common to both systems. Further, an auxiliary lens system is disposed along said common light entry axis in front of said observation systems, said auxiliary means being adapted to displace the entrance pupils of said observation systems along said light entry axis in a forward direction. In specific embodiments of the invention a reticule and/or prismatic elements are part of the auxiliary lens system. The prismatic elements are disclosed to be adjustable to vary the direction of view of the telescope.

3,712,703
REAR VIEW MIRROR WITH AIR VANE ROTATION MEANS

Charles Barrington Newdigate, Cape Town, South Africa, assignor to Ivan Henry Cathcart-James, Cape Town, South Africa

Filed Jan. 25, 1971, Ser. No. 109,488
Claims priority, application South Africa, Feb. 13, 1970, 70/0990
Int. Cl. G02b *5/08*; B60r *1/06*
U.S. Cl. 350—62 **2 Claims**

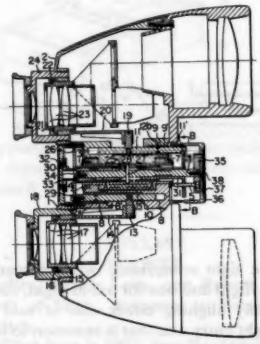


The invention provides a reflector device having a mirror, a support frame, mounting means for mounting the mirror on the support frame for rotation about an axis perpendicular to the mirror's reflecting surface, a plurality of radially extending vanes attached to the mirror's periphery to cause the mirror to rotate when air passes through the vanes, and air guide means for guiding air towards the vanes.

3,712,704
FOCUSING DEVICE IN A CENTER FOCUSING TYPE BINOCULAR

Akira Sato, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Dec. 23, 1971, Ser. No. 211,378
Claims priority, application Japan, Dec. 28, 1970, 45/132664
Int. Cl. G02b *7/06*
U.S. Cl. 350—76 **3 Claims**

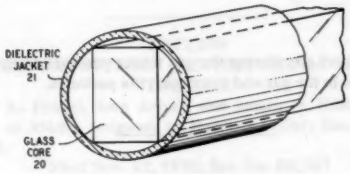


A center focusing type binocular having a first and a second body tube interconnected so that at least one of the body tubes is revolvable about a pivot sleeve, and inner lens frames for holding ocular systems therein and mounted for sliding along optical axes within the respective body tubes. The focusing device is improved in that the first body tube is formed with a guide groove extending axially from the end thereof adjacent to a T-shaped slidable tube, the second body tube is formed with a guide groove extending axially from the end thereof adjacent to a T-shaped rotatable ring, both grooves being parallel to the pivot sleeve, and an O-ring is interposed between each of the guide grooves and slidable shafts inserted in said grooves, whereby a perfect air-tight condition is maintained in the focusing device without using any seal means and a reduced torque is required to adjust the relative position of the two body tubes in accordance with the interpupillary distance of any viewer.

3,712,705
AIR CLAD OPTICAL FIBER WAVEGUIDE

Enrique Alfredo Jose Marcatili, Runson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 28, 1971, Ser. No. 147,845
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **6 Claims**

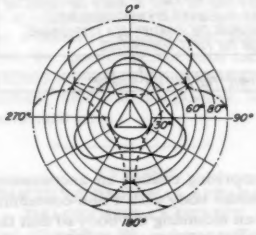


An air clad optical fiber is described comprising a low-loss dielectric core, having a polygonal cross section disposed within a circular jacket. Because of its shape, the core is, in effect, totally surrounded by air, contacting the outer jacket at only its corners. To further minimize the number of contacting regions, and increase the spacing between core and jacket, the latter is made oversized.

3,712,706
RETROREFLECTIVE SURFACE

Robert Franz Stamm, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 4, 1971, Ser. No. 103,543
Int. Cl. G02b *5/12*
U.S. Cl. 350—103 **16 Claims**

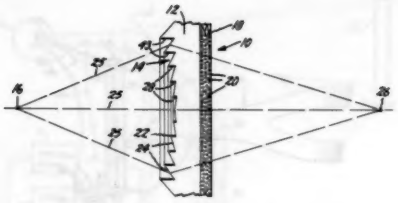


A retroreflector of unusually high retroreflective efficiency comprises an array of cube corner reflectors arranged as shown in FIG. 1. The cube corners are made so extremely accurately and of such small size teat diffraction is the predominant factor governing the divergence from perfect retroreflection of the reflected light. The retroreflectors have various uses and are particularly efficient reflectors for highway signs and markers.

3,712,707
COMPOSITE BACK PROJECTION SCREEN AND METHOD OF FORMING

John L. Henkes, Jr., Loudonville, N.Y., assignor to General Electric Company

Filed Feb. 27, 1970, Ser. No. 15,127
Int. Cl. G03b 21/60, 21/62
U.S. Cl. 350—122 8 Claims

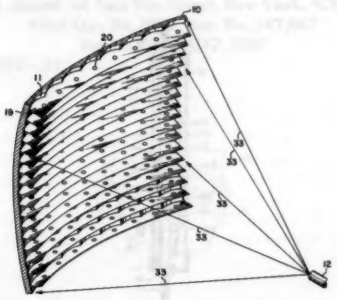


A composite back projection screen exhibiting a highly uniform intensity distribution and reduced scintillation is formed by embossing a Fresnel lens along either the front or back face of a thermoplastic sheet to focus projected light upon a predetermined viewing location and coating the front face of the sheet with a layer of bulk diffusing material to effect a multiple scattering of light passing through the layer. Desirably, either the risers of the Fresnel lens and/or the layer of bulk diffusing material is blackened to enhance the ambient rejection of the projection screen.

3,712,708
LENTICULAR PROJECTION SCREEN

John Brown, P.O. Box 201, New Hope, Pa.

Filed Sept. 9, 1971, Ser. No. 178,990
Int. Cl. G03b 21/60
U.S. Cl. 350—129 7 Claims



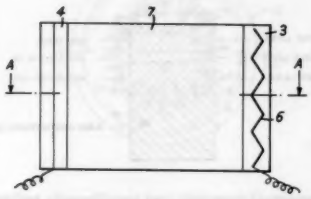
A lenticular projection screen consisting of a plurality of overlapping, spherical concave lenses formed in reflective material. The lenses and the screen are constructed so that projected light rays are directed to a predetermined viewing area in front of the screen, in order to reduce scattering losses and provide high quality screen images in a fully lighted room or in daylight.

3,712,709
VARIABLE LIGHT TRANSMISSION DEVICE

John Grahame Kenworthy, Runcorn, Cheshire, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 22, 1971, Ser. No. 200,776
Int. Cl. G02f 1/36; C07d 31/42
U.S. Cl. 350—160 R 7 Claims

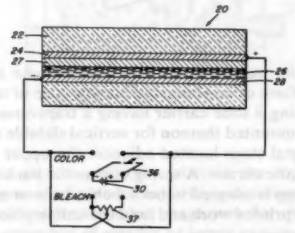
Device for light transmission control in response to electrical signals. A N-substituted p-cyanophenyl derivative of, for example, a bipyridyl is reversibly transformed between the cationic form (colorless) and radical (usually green) by application of potential between a transparent conducting electrode and a counter electrode.



3,712,710
SOLID STATE ELECTROCHROMIC MIRROR

George Augustus Castellion, Stamford, and Donald Paul Spitzer, Riverside, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 21, 1970, Ser. No. 99,909
Int. Cl. G02f 1/36
U.S. Cl. 350—160 8 Claims



Electro-optical device particularly useful in the modulation of reflected light typically comprising an electrochromic device containing a reflecting layer electrode in sandwiched arrangement, said electrochromic device being a sandwich arrangement of a transparent electrode, a reflecting layer electrode, a film of a transition metal compound and a solid insulating film disposed between the electrodes. The electrochromic device exhibits coloration and bleaching thereof at ambient temperature by control of the polarity of an applied electric field, whereby light reaching the reflecting solid layer electrode is modulated in intensity, thus modulating, in turn, the reflected light.

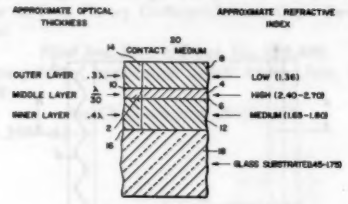
3,712,711
TRIPLE-LAYER ANTI-REFLECTION COATING DESIGN

Iwao P. Adachi, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 10, 1969, Ser. No. 790,342
Int. Cl. G02b 1/10
U.S. Cl. 350—164 7 Claims

An optical element such as a lens has a triple layer anti-

reflection coating having a very thin, high refractive index middle layer. The middle layer is matched and provides a



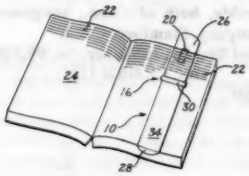
broadened spectral response, yet significantly reduces absorption, scattering and reflections even with incident angle variations.

3,712,712

ADJUSTABLE COLUMN MAGNIFIER

George O. Bosma, Denver, Colo., assignor to Lri Corporation, Denver, Colo.

Filed Feb. 24, 1969, Ser. No. 801,706
Int. Cl. G02b *27/02*
U.S. Cl. 350—247 **10 Claims**



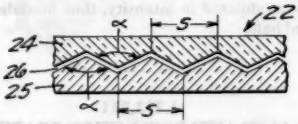
This invention relates to an adjustable column magnifying device in the form of an elongated narrow strip of transparent material forming a slide carrier having a transversely-extending magnifier mounted thereon for vertical slidable movement between integral stops located adjacent the upper and lower extremities of the carrier. A spring clip on the back of the carrier near the top is adapted to hook behind one or more pages of a columnar printed work and hold the unit in place.

3,712,713

OPTICAL SHIELD OF TRANSPARANT INTERMESHED GROOVED PANELS USEFUL ON OVERHEAD PROJECTS

Roger H. Appledorn, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 712,262, March 11, 1968, abandoned. This application Aug. 10, 1970, Ser. No. 62,356
Int. Cl. G02b *27/00*
U.S. Cl. 350—276 R **6 Claims**



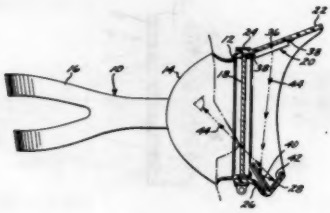
A glare control shield having particular utility in an overhead projector, consists of fully transparent matching grooved plates which are disposed between stage and Fresnel condensing lens of the projector and with the grooves generally directed toward the position of the operator. Other applications are described.

3,712,714

INFORMATION DISPLAY FOR DIVER'S FACE MASK

Leon R. Uyeda, 7231 Emerson Avenue, Westminster, Calif., and Jerry A. Emery, 17331 Elsinore Circle, Huntington Beach, Calif.

Filed June 15, 1971, Ser. No. 153,365
Int. Cl. G02b *5/08*
U.S. Cl. 350—301 **4 Claims**



An information display means as a part of or for attachment to a diver's face mask, and including diver status indicators such as a clock, compass, air pressure gauge or the like, located out of the diver's usual line of sight, and further including reflecting surfaces, one of which is offset from such usual line of sight but encompassed by the diver's field of vision so that an optical path is provided from such reflecting portion to the status indicators, enabling the diver to selectively view his surroundings or the reflected image of the status indicators.

3,712,715

MULTIPLE RANGE REAR VISION MIRROR

Carl E. Wagner, 6190 West Jefferson Place, Lakewood, Colo.

Filed March 22, 1972, Ser. No. 237,087
Int. Cl. G02b *5/08*
U.S. Cl. 350—304 **6 Claims**

A rear vision mirror, normally mounted on the exterior of a vehicle, includes at least two mirrors mounted on a single central post and contained in a housing with one transparent side, providing adjustment means for each mirror operable through holes in the housing.

3,712,716

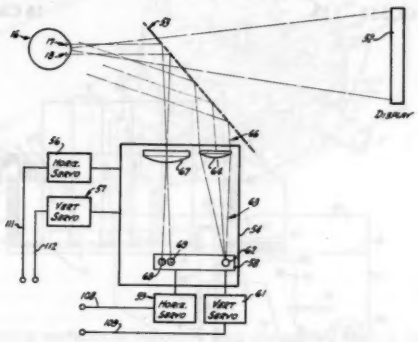
EYE TRACKER

Tom N. Cornsweet, Atherton, Calif., and Hewitt D. Crane, Portola Valley, Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed April 9, 1971, Ser. No. 132,678
Int. Cl. A61b *3/10*
U.S. Cl. 351—7 **12 Claims**

An eye tracker for continuously tracking orientation of the optic axis of an eye in which the eye is flooded with light so that Purkinje images are formed. Two of the Purkinje images are deflected so as to be incident on photodetectors. In one

embodiment the detectors and the light source are moved so that the light sources move to keep the Purkinje images centered on the two photodetectors with a fixed distance between the images. The positions of the light source in order to obtain the predetermined distance between the Purkinje images is monitored and gives an indication of the orientation of the



optic axis of the eye. In another embodiment only one photodetector is used with two alternating light sources and means are provided to form the two Purkinje images respectively from the two light sources. Further means are provided with the photodetector for differentiating between the two Purkinje images.

3,712,717

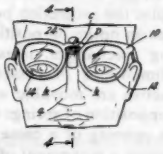
DEVICE FOR ELEVATING AND SUPPORTING BIFOCAL SPECTACLES

Charles I. Stoloff, 46 East 91st Street, New York, N.Y.

Filed May 26, 1971, Ser. No. 147,007

Int. Cl. G02c *5/12, 7/06*

U.S. Cl. 351—55 **5 Claims**



A device for elevating and supporting a pair of bifocal spectacles for straight ahead near vision embodying a unitary member mountable and demountable from the nose of the user, shaped at its rear to be supported on the saddle bone and bridge of the user's nose and at its front for receiving, lodging and supporting the bridge piece of the spectacles.

3,712,718

CORNEAL CONTACT LENS

Joseph A. LeGrand, 16 Arrowhead Trail, Media, Pa., and Arl Fuhrman, 6624 Rutland Street, Philadelphia, Pa.

Filed Oct. 23, 1970, Ser. No. 83,453

Int. Cl. G02c *7/04*

U.S. Cl. 351—160 **7 Claims**

A corneal contact lens having a transparent central zone is provided with an irregular pattern of colored striations in the surrounding peripheral zone in order to highlight the natural color of the wearer's iris, without requiring a lens large enough to cover the entire iris. Transparent regions about the striations extend the optical area into the peripheral zone so that central vision is not restricted and peripheral vision is improved.

3,712,719

PROJECTOR FOR USE WITH MAGAZINES AND REELS FOR MOTION PICTURE FILM

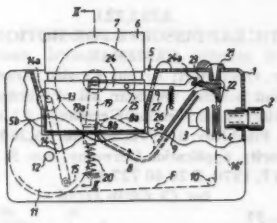
Johann Zanner, Jr., 8025 Unterhaching, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 10, 1971, Ser. No. 141,826

Claims priority, application Germany, May 21, 1970, P 20 24 637.1

Int. Cl. G03b *23/02*

U.S. Cl. 352—73 **8 Claims**



A motion picture projector wherein the top wall of the housing is provided with an inwardly extending chamber for reception of smaller or larger magazines for motion picture film or for reception of smaller or larger exposed supply reels for motion picture film. The housing contains an automatic threading unit for the leader of motion picture film in a magazine and a manually operated threading unit serving for threading of motion picture film which is stored on an exposed supply reel. The reel can be mounted for rotation in the chamber by moving a mandrel from a retracted position to an extended position in which the mandrel extends through the central opening in the core of the reel. Such movement of the mandrel is utilized to move an obstructing member away from the inlet for manual threading of motion picture film which is stored on a reel.

3,712,720

MOTION PICTURE CAMERA WITH FADING MEANS

Alfred Winkler, Munich; Friedrich Winkler, Unterhaching; Karl Neudecker, Munich, and Johann Zanner, Jr., Unterhaching, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 30, 1970, Ser. No. 76,950

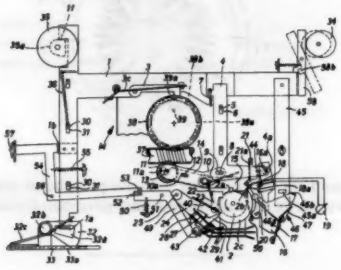
Claims priority, application Germany, Oct. 3, 1969, P 19 49 891.0

Int. Cl. G03b *21/36*

U.S. Cl. 352—91 **31 Claims**

A motion picture camera wherein the exposures with fade-out effect are automatically followed by a rearward transport of that length of film which was exposed during fade-out and

the camera motor is arrested on completion of such rearward transport. The systems which adjust the diaphragm during fade-out, which reverse the direction of operation of the motor subsequent to fade-out, and which stop the motor on completion of rearward transport of the film receive motion



from a programming disk which is indexed stepwise in response to operation of the film transporting mechanism as soon as the user moves an actuating knob to an operative position. The exposures with fade-in effect begin on movement of the actuating knob from its operative position and in response to depression of the camera release element.

3,712,721

AUTOMATIC LAP DISSOLVE FOR MOTION PICTURE CAMERAS

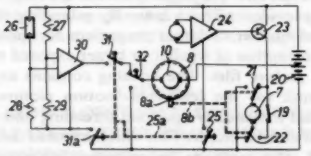
Heinz Keiner, Oberndorf; Arthur Kessler, Grossaltenstadten, and Wilhelm Schafer, Wetzlar, all of Germany, assignors to Ernst Leitz GmbH Wetzlar, Germany

Filed Nov. 2, 1970, Ser. No. 86,260

Claims priority, application Germany, Nov. 5, 1969, P 19 55 563.6; Aug. 17, 1970, P 20 40 727.6

Int. Cl. G03b *21/36*

U.S. Cl. 352—91 **4 Claims**



Automatic lap dissolve mechanisms are provided in motion picture cameras having an electronic film drive, a diaphragm with leaves positioned in the light path of the camera, current controlled diaphragm control means coupled to the diaphragm and photo resistor position in the light path from an object to be photographed and connected to the diaphragm control means for varying the magnitude of current in the diaphragm control means and thereby varying the opening of the diaphragm in accordance with the intensity of light in the light path from the object to be photographed. The automatic lap dissolve mechanism includes:

(a) two electrical contacts actuated by the diaphragm leaves moving into their closed position to effect a reversal of the polarity of the camera motor;

(b) switching means arranged in the circuit of the camera motor; and (c) a timer which is actuated at the beginning of the camera motor reversal of polarity and operates the switching means after a predetermined period of time has elapsed to interrupt the current flow to the camera motor.

3,712,722

MOTION PICTURE PROJECTOR WITH CARRIAGE FOR SETS OF FILM-CONTAINING CASSETTES

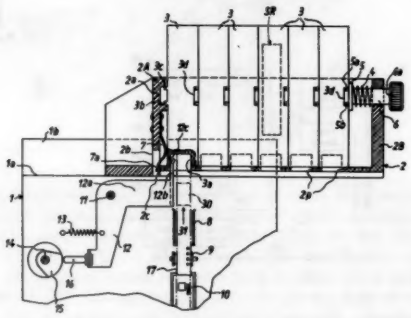
Karl Neudecker, Munich, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed March 15, 1971, Ser. No. 124,346

Claims priority, application Germany, March 24, 1970, P 20 13 969.9

Int. Cl. G03b *21/04*

U.S. Cl. 352—123 **16 Claims**



A motion picture projector wherein a reciprocable carriage supports a set of abutting cassettes for motion picture film which is stored therein on supply reels and can be withdrawn through openings in bottom walls of the respective cassettes. The cassettes are insertable directly into the carriage or into a magazine which is removably inserted into the carriage. Each cassette has limited freedom of movement with reference to the carriage. The carriage is movable between several positions in each of which a different cassette occupies a projection position in which the parts of a film threading or withdrawing mechanism can enter the opening of such cassette from below in order to withdraw the leader of convoluted film and to move the leader into the range of a film transporting mechanism. A lever which is pivotable by the advancing mechanism for the carriage enters the opening of the cassette which occupies the projection position to insure that such opening assumes an optimum position with reference to the film withdrawing mechanism, irrespective of eventual deviations of the dimensions of cassettes from a desired dimension. The cassettes are movable with reference to the carriage against the opposition of springs which yield when the lever enters into the opening of a cassette in the projection position to thereby cause a movement of the opening of such cassette into exact registry with the film withdrawing mechanism.

3,712,723

SOUND SYNCHRONIZED SLIDE PROJECTOR

Martin E. Gerry, 13452 Winthrope Street, Santa Ana, Calif.

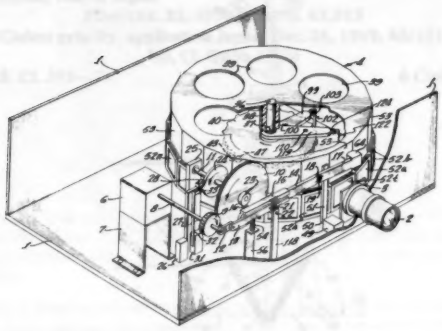
Division of Ser. No. 736,542, May 28, 1968, which is a continuation-in-part of Ser. No. 528,707, Feb. 21, 1966. This application April 13, 1970, Ser. No. 27,937

Int. Cl. G03b *31/06, 21/00*

U.S. Cl. 353—19 **10 Claims**

The invention is directed to providing a member of an audio-visual projector together with the projector, the member containing a plural number of slides and an equal plural number of audio recording surfaces wherein the slides and recording surfaces are inseparable portions of the member. Associated with the various configurations of the member are

suitable control mechanisms which enable synchronous recording of sound and reproduction of sound from these



recording surfaces at the same time the related slide is being projected. The control mechanisms also provide automatic injection of slides and related sound tracks.

3,712,724

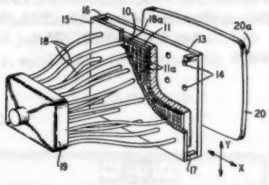
OPTICAL READOUT APPARATUS

Jeofry Stuart Courtney-Pratt, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 3, 1970, Ser. No. 94,672

Int. Cl. G03b *23/02, 21/26, 21/14*

U.S. Cl. 353—25 **9 Claims**



This disclosure describes optical readout apparatus which utilizes numerous partial images produced by lenticular plate optics to compose an image on a screen. The recorded medium and lenticular plate remain stationary and advantageously are a single replaceable unit. Slight X–Y movement of an aperture plate stationed forward of the lenticular plate reproduces a set of partial images for each of its numerous positions, each set composing on a screen into a section of reading matter. The device is useful as an optical telephone directory.

3,712,725

FILMSTRIP ADAPTER FOR SLIDE PROJECTOR

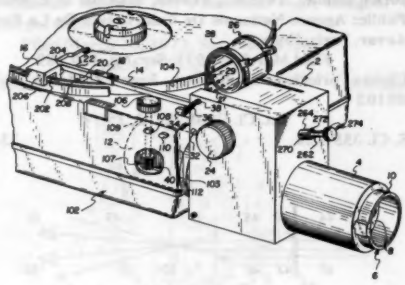
George H. Eckerdt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed April 13, 1970, Ser. No. 27,519

Int. Cl. G03b *23/00, 21/00, 3/00*

U.S. Cl. 353—68 **11 Claims**

An adapter for enabling a slide tray projector to project filmstrip has a filmstrip advancing mechanism operated by the projector tray advancing means, and a focusing mechanism responsive to the operation of the projector focusing mechanism. The adapter is secured to the projector by the



projector lens mount, and the projector lens assembly is attached to the adapter in a mount having an axis on the projection axis of the projector.

3,712,726

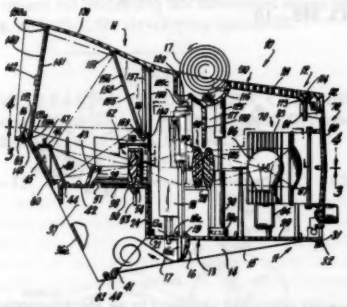
PHOTOGRAPHIC VIEWER

Eugene Martinez, Irvington, N.Y., assignor to Robert H. Reibel, Croton, N.Y.

Filed March 30, 1971, Ser. No. 129,448

Int. Cl. G03b *23/00, 21/28;* **G03h** *3/00*

U.S. Cl. 353—68 **15 Claims**



This viewer is essentially a projector with a built-in rear projection screen and uses a two-reflecting mirror system. One form of the invention is a film strip viewer, and comprises top and bottom housing sections holding all components of the optical system. The bottom housing section has means to hold both the projecting lens and one of the reflecting mirrors of the two mirror system, in two positions. In one position of the projecting lens and said one mirror in said bottom housing section, one top housing section is assembled with the bottom section to provide a film strip viewer. In another position of said projecting lens and of said reflecting mirror, an alternate top housing section may be assembled with the same bottom section to provide a viewer for slides mounted in multiple slide holders of various constructions.

3,712,727

METHOD FOR IMPROVING THE DIRECT VISION OF RELIEF SLIDES AND EQUIPMENT FOR CARRYING OUT SAID METHOD

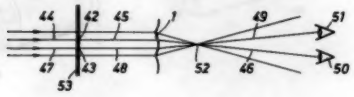
Maurice Bonnet, Puteaux, France, assignor to Etablissement Public: Agence Nationale De Valbrisation De La Recherche Anvar, Paris, France

Filed March 2, 1971, Ser. No. 120,189

Claims priority, application France, March 6, 1970, 7008103

Int. Cl. G03b 27/32, 35/14

U.S. Cl. 355—22 23 Claims



The method consists (a) in decreasing the angular value of the apparent diameter of the light source seen by a refractive or reflecting lenticular element, in order that the rays reaching each lenticular element may be considered as parallel, this decrease being restricted to a controlled value depending on the constant of the optical surface considered as a diffraction network and (b) in decreasing as considerably as possible the distance between the diopters constituting an orientation optical system of the lightrays and the points of composite images receiving the said light rays. The invention is applicable to relief photography and cinematography. It improves the direct vision of relief slides and films.

3,712,728

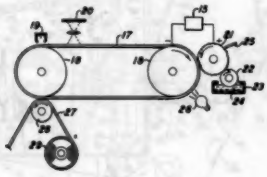
REVERSAL DEVELOPMENT

Gary L. Whittaker, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,331

Int. Cl. G03g 15/10

U.S. Cl. 355—10 4 Claims



Reversal prints are obtained in an electrostatographic imaging system employing polar liquid development wherein after development the electrostatographic imaging surface is discharged in the charged undeveloped areas to reduce lateral spreading of the polar liquid developer from the developed uncharged areas into the charged background areas of the imaging surface.

3,712,729

DOCUMENT REPRODUCTION APPARATUS

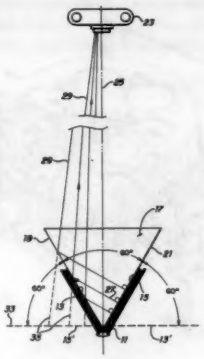
John A. O'Brien, Reading, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Aug. 6, 1971, Ser. No. 169,713

Int. Cl. G03b 27/32, 27/52

U.S. Cl. 355—25 7 Claims

Apparatus is disclosed for simultaneously receiving images contained on facing pages of a document, the apparatus has an optical element with a first and a second flat surface joined together at one edge of each surface, one of the surfaces parallel to one of the facing pages and the other of the surfaces parallel to another of the pages, and, image receiving system remote from the element with an optical axis parallel to a line bisecting the surfaces.



3,712,730

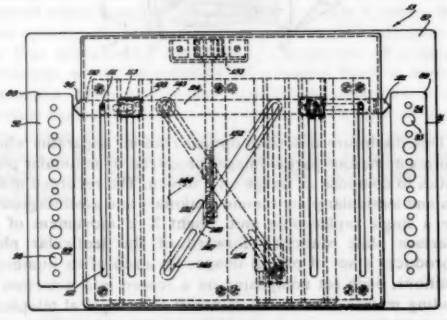
AUTOMATIC DENSITY SETTING APPARATUS

Leonard S. Florsheim, Jr., Lake Forest, Ill.; Harold B. Archer, Philip F. LoPresti, both of Henrietta, N.Y., and Thurlow J. Sutherland, Rochester, N.Y., assignors to Enivar Enterprises Inc., Chicago, Ill.

Division of Ser. No. 786,280, Dec. 23, 1968, Pat. No. 3,611,159. This application March 22, 1971, Ser. No. 126,463

Int. Cl. G63b 27/76

U.S. Cl. 355—69 7 Claims



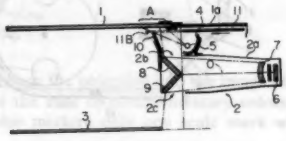
An automatic density setting apparatus for converting copy densities into exposure times for main, flash and bump exposures required in half-tone reproduction. Two separately prepositionable scales of an evaluator are set to store intelligence mechanically corresponding to highlight and shadow densities of material to be copied. A master control unit converts the mechanical settings into appropriate electrical signals for automatically regulating the camera lights, and auxiliary flash lamp and the shutter of a process camera in order to automatically and instantaneously provide properly exposed main, flash and bump exposures.

3,712,731

HEAT SHIELD DEVICE FOR A REPRODUCING APPARATUS

Toshio Shiina, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Oct. 22, 1970, Ser. No. 82,913
Claims priority, application Japan, Dec. 28, 1969, 45/1318
Int. Cl. G03b 27/76
U.S. Cl. 355—71 6 Claims



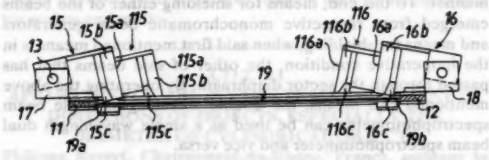
A heat shield device for a reproducing apparatus wherein a heat shield plate is mounted for motion between an original document table and a light source lamp, the plate is positioned between the table and the lamp for a time period during which the luminous intensity of the lamp reaches a certain point, and the plate is removed from between the table and the lamp when the luminous intensity of the lamp reaches a certain point, whereby the lamp is prevented from heating the table partially.

3,712,732

APPARATUS FOR GUIDING THE MARGINAL PORTIONS OF WIDE AND NARROW STRIPS OF PHOTOSENSITIVE MATERIAL OR THE LIKE

Josef Lederer, 8014 Neubiberg, Germany, assignor to AGFA Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 30, 1971, Ser. No. 167,749
Claims priority, application Germany, Aug. 6, 1971, P 20 39 205.6
Int. Cl. G03b 27/58
U.S. Cl. 355—72 15 Claims



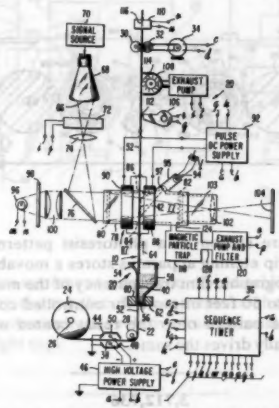
Apparatus for guiding strips of different widths past the exposure window in a photocopying machine has a pair of stationary guide rails which define a passage for entry and proper guidance of a relatively wide strip. Two guide blocks are pivotable about axes which are parallel to the direction of transport of the strips through the passage to move between operative positions in which the blocks reduce the effective width of the passage to that of the width of a relatively narrow strip and inoperative positions in which the blocks do not interfere with the entry and transport of the wide strips. The leader of a wide strip automatically engages and pivots the blocks to their inoperative positions and such blocks tend to assume their operative positions under the action of gravity and/or under the bias of springs.

3,712,733

MAGNETO-ELECTRIC APPARATUS FOR REPRODUCING AN IMAGE ON A RECORDING ELEMENT

Edward Charles Giaimo, Jr., Princeton, N.J., assignor to RCA Corporation

Filed March 30, 1972, Ser. No. 239,429
Int. Cl. G03g 15/00
U.S. Cl. 355—3 8 Claims



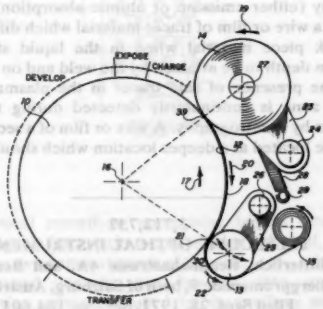
An image is reproduced on the surface of a recording element, comprising a light-transmitting substrate and a photoconductive layer, by apparatus adapted to move the recording element past charging, toning, and image-exposing stations, in the order named. The recording element is uniformly charged, uniformly toned with magnetic toner particles, and exposed to a light image at the aforementioned stations, respectively. A magnetic field is disposed adjacent the image-exposing station to remove toner particles from the light-struck portions of the recording element during the exposure thereof, whereby to develop the image. The apparatus also includes means for projecting the developed image onto a screen, during, and after, the developing operation.

3,712,734

DEVICE FOR CLEANING XEROGRAPHIC CYLINDERS

Dragan Jovanovic, Herzogstrasse 21, Duesseldorf, Germany

Filed March 23, 1971, Ser. No. 127,162
Int. Cl. G03g 15/22
U.S. Cl. 355—15 3 Claims



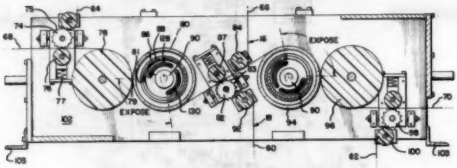
A device for wiping clean xerographic cylinders using a web of cloth-like material maintained in contact with the drum as it rotates. The contact area covers a considerable angular extent of the drum for substantially its entire width and when compared to similar prior art devices, provides greater cleaning action, uses less web material per drum revolution, and reduces drum wear due to web contact.

3,712,735

APPARATUS FOR PHOTO ETCHING

J. A. Crumley; James Ross Hildebrand, both of Camp Hill, Pa.; Harold Alfred Kerstetter, Shiremanstown, Pa.; and Ray Ned Shaak, Lebanon, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 25, 1970, Ser. No. 75,397
Int. Cl. G03b 27/04
U.S. Cl. 355—85 10 Claims



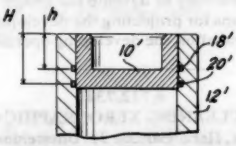
The exposure station of a photoresist pattern controlled continuous strip etching apparatus stores a movable, continuous loop photographic film transparency of the master pattern in lengths up to 50 feet or more for controlled contact photo printing of the pattern onto the resist coated moving strip which frictionally drives the same.

3,712,736

METHOD AND DEVICE FOR TESTING WELDS BY OPTICAL SPECTROGRAPHY

Marcel Boncoeur, Paris; Louis Heintz, Antony; Jean Langrand, Palaiseau; and Michel Lavaud, Ris-Orangis, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 5, 1971, Ser. No. 103,993
Int. Cl. G01j 3/00; G01n 1/00
U.S. Cl. 356—74 8 Claims



A method of testing welded work pieces by optical spectrography (either emission or atomic absorption) comprises locating a wire or film of tracer material which diffuses within the work piece material when in the liquid state, at the minimum depth to be attained by the weld and on the welding path. The presence of said tracer in the plasma above the welding zone is continuously detected during the welding operation by spectrography. A wire or film of a second material may be located at a deeper location which should not be attained.

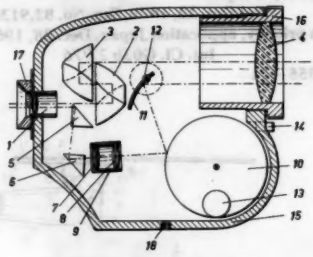
3,712,737

TELESCOPIC OPTICAL INSTRUMENT

Walter Bitterlich, Rennbahnstrasse 4A, and Benno Hesske, Krevzbergpromenade 9, both of Salzburg, Austria

Filed Sept. 28, 1971, Ser. No. 184,601
Claims priority, application Austria, Oct. 5, 1970, 8948/70
Int. Cl. G01c 1/06, 3/00
U.S. Cl. 356—8 2 Claims

A telescopic instrument for optically measuring the distance of a viewed object, with automatic reduction of the measured values in the horizontal distance and simultaneous measurement of the width and height of a distant object, such as a tree trunk. In the optical path between the objective and eyepiece of the telescope is mounted a first prism whose upper edge divides the field of view into an upper and a lower part. A pendulum drum carries a measuring scale and is so arranged in the telescope housing that the visual rays of the lower part of the field of view are focused on a measuring scale section which is viewed in the lower part while the upper part of the field of view is covered by the portion of the distant object to which the telescope is directed.

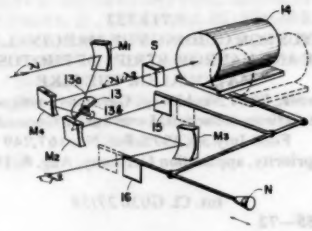


3,712,738

ILLUMINATOR SYSTEM FOR USE IN SPECTROPHOTOMETER

Hiroshi Yamamoto, Kyoto, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed March 10, 1971, Ser. No. 122,883
Int. Cl. G01j 3/42
U.S. Cl. 356—93 8 Claims



An illuminator system for use in a spectrophotometer by which the mode of operation can be easily changed in a simple manner. To this end, means for shielding either of the beams emerged from respective monochromatic beam generators and means for shielding, when said first mentioned means is in the inoperative condition, the other of said beams that has passed through the sector diaphragm. By operating the above mentioned two means, the double wavelength, single beam spectrophotometer can be used as a single wavelength dual beam spectrophotometer and vice versa.

3,712,739

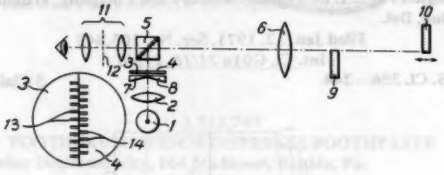
AUTOCOLLIMATOR FOR DETERMINING THE POSITION OF TWO REFLECTORS RELATIVE TO EACH OTHER

Fromund Hock, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Continuation-in-part of Ser. No. 734,099, June 3, 1968, abandoned. This application Oct. 19, 1970, Ser. No. 82,108
Claims priority, application Germany, June 8, 1967, L 56695
Int. Cl. G01b 11/27
U.S. Cl. 356—118 6 Claims

In an autocollimator two systems of scale marks are projected by the autocollimator objective into infinity. With regard to their image-forming properties both systems are com-

plementary to each other, preferably they are tinted in complementary colors, or are polarized in directions normal to each other. The images of the scale marks are reflected by a reference and a measuring mirror. Both mirrors reflect said



images back through the objective into the image plane of the ocular where in the case of complementary colors owing to the additive color mixture only one scale mark will appear white.

3,712,740

METHOD FOR THE AUTOMATIC ALIGNMENT OF TWO ARTICLES TO BE BROUGHT INTO REGISTER WITH ONE ANOTHER

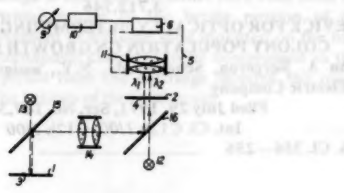
Klaus Hennings, Reutlinger Strasse 25, Heilbronn, Germany

Filed April 20, 1970, Ser. No. 30,051

Claims priority, application Germany, April 19, 1969, P 19 19 991.8

Int. Cl. G01b *11/26*

U.S. Cl. 356—152 **34 Claims**



A method for the automatic alignment of two articles to be brought into register with one another comprises forming an associated register mark on each article, detecting the register marks associated with one another on both articles using a single optical measuring system, and aligning the articles as a result of the detection. The method may suitably be applied to sheets provided with structures therein, such as semiconductor wafers and masks.

3,712,741

APPARATUS FOR THE ACCURATE MEASUREMENT OF DIMENSIONS OF OBJECTS, ESPECIALLY THE DIAMETER OF CYLINDRICAL OBJECTS

Philippe Revert, Chateauneuf-du-Rhone, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Oct. 19, 1970, Ser. No. 81,883

Claims priority, application France, Nov. 6, 1969, 6938215

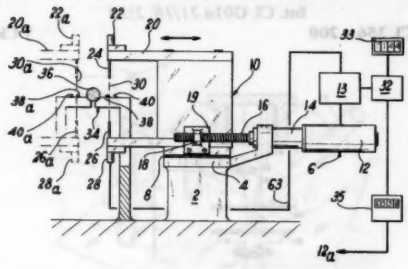
Int. Cl. G01b *11/10*

U.S. Cl. 356—160 **15 Claims**

The apparatus comprises two identical carriages mounted in opposite relation and driven in horizontal translational motion on a stationary frame, a stirrup mounted on each carriage for supporting an emitting and receiving optical system which defines a substantially vertical light ray having high definition, an optical gage and stops which are supported together with the cylindrical object to be measured on a fixed stage which is located substantially in the central horizontal plane of the stirrups, the stage being provided with a vertical slot for the passage of the light rays which are produced by the optical system.

The optical system comprises a stable light source, a photosensitive receiver, a capillary tube on each stirrup arm for defining the path of the light ray with high precision.

Means are also provided for controlling the rotation of the



carriage-drive systems according to a preestablished program, for recording the relative displacements of the carriages and indicating numerically the relative translational displacements of the two light rays.

3,712,742

ANALYTICAL CENTRIFUGES HAVING A PHOTOELECTRIC DETECTION

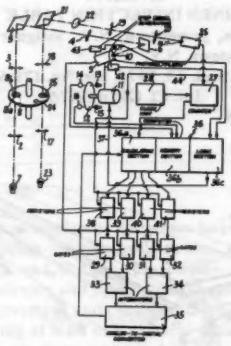
Rene A. Cohen, Paris, France, assignor to Anvar - Agence Nationale De Valorisation De La Recherche, Paris, France

Filed Aug. 3, 1970, Ser. No. 60,599

Claims priority, application France, Aug. 5, 1969, 6926819

Int. Cl. G01n *21/24*

U.S. Cl. 356—197 **7 Claims**



An analytical centrifuge comprising logical circuits for separating signals from various centrifuging cells and, for each cell, from the two compartments of the cell.

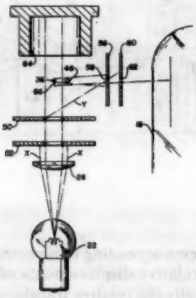
These logical circuits are brought into action by synchronization pulses produced by an auxiliary photomultiplier for one or several predetermined angular positions of the rotor. The signals corresponding to the respective cell compartments are integrated separately each signal corresponding to the totality of the light passing through each compartment. This centrifuge is of utility in particular for examining the movements of a macromolecule in a solution subjected to a field of forces.

3,712,743

APPARATUS FOR DETECTING AND MEASURING YARN DEFECTS AND IRREGULARITIES

James Harris, Bristol, Tenn., and Robert L. Watson, Bluff City, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 5, 1971, Ser. No. 103,973
Int. Cl. G01n *21/18, 2/30*
U.S. Cl. 356—200 7 Claims



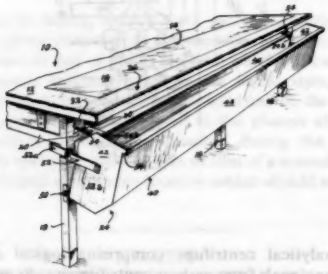
Apparatus for detecting light reflections from yarn irregularities, such as broken filaments, fluffs, loops and the like which extend from the normal body of a moving yarn strand. The yarn strand is directly illuminated, and a shadowbar is positioned outside the path of light illumination between the yarn strand and the detection apparatus. The shadowbar is of such dimension as to be larger than the normal body diameter of the yarn strand so as to block reflection from the normal body of the yarn strand from the detection apparatus but enables reflected light from any yarn irregularities extending from the normal body of the yarn strand to be detected by the detection apparatus, such as a photomultiplier tube.

3,712,744

LINEN INSPECTION TABLE

Robert W. Nelson, Jamestown, N.Y., assignor to AVM Corporation, Jamestown, N.Y.

Filed Sept. 13, 1971, Ser. No. 179,643
Int. Cl. G01n *21/16*
U.S. Cl. 356—238 4 Claims



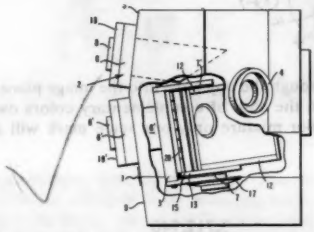
A table for use in inspecting linens having a translucent table surface area, which is illuminated from below for the purpose of revealing tears of rips in linens moved across such area, and a table side mounted bin for receiving the linens passing over the edge of the table. The bin is characterized as being supported for pivotal movement between a linen receiving position and a non-use position, wherein it is completely recessed beneath the overhang of the table. Means are provided to selectively retain the bin in either of its positions.

3,712,745

SPECTROPHOTOMETER MULTI-ANGLE VIEWING DEVICE

William S. Armstrong, Jr., Phoenixville; Webster H. Edwards, Springfield, and Roy H. Vining, Haverford, all of Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 12, 1971, Ser. No. 105,843
Int. Cl. G01n *21/16, 21/48*
U.S. Cl. 356—244 5 Claims



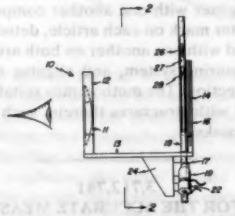
A spectrophotometer multi-angle viewing device with a housing and holders for a test panel and reference standard. The holders allow rotation of a reference standard 360° in a vertical plane and rotation of a test panel 360° in a vertical plane and ± 45° from the horizontal in a vertical plane perpendicular to the vertical plane in which the 360° rotation is possible.

3,712,746

DEVICE FOR OPTICALLY DETERMINING MICROBIAL COLONY POPULATION ON GROWTH SURFACE

John A. Bergeron, Schenectady, N.Y., assignor to General Electric Company

Filed July 29, 1971, Ser. No. 167,365
Int. Cl. C12b *1/00*; C12k *1/00*
U.S. Cl. 356—256 6 Claims



A viewer-comparator device is described for optically determining the density of microbial colony growth in and on an inoculated nutrient layer. In the preferred construction the device comprises a base, a magnifying lens supported thereon, means connected to the base for supporting a nutrient layer-coated surface, this surface being located in position for viewing thereof through the lens, means to enable direct visual comparison by an observer between the appearance of the nutrient layer-coated surface and reproductions of microbial growth at a plurality of representative intervals over a range of growth densities of clinical interest and lighting means depending from the base. The comparison enabling means is located adjacent the position to be occupied by the nutrient layer-coated surface for simultaneous viewing of both the comparison enabling means and the coated surface through

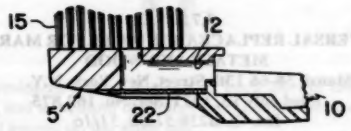
the lens. The lighting means are so directed that light rays emanating therefrom cannot pass to the lens by reflection or by direct passage from lighting means to lens. With the lighting means so disposed and directed, the microbial colonies will scatter the light reaching them and appear bright in an essentially dark field (i.e. no bright background).

3,712,747

TOOTHBRUSH WHICH DISPENSES TOOTHPASTE

Walter Drohomirecky, 164 5th Street, Rankin, Pa.

Filed Sept. 18, 1970, Ser. No. 73,421
Int. Cl. A46b *11/02*
U.S. Cl. 401—155 3 Claims



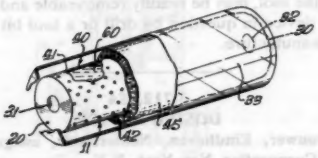
A toothbrush which contains a toothpaste cartridge cavity located within its hollow or split handle into which a toothpaste cartridge is inserted. An outlet bore runs from the toothpaste cartridge nozzle to the bristle portion of the toothbrush. Movement of a thumb slide mounted on the handle causes the toothpaste cartridge to be compressed so that toothpaste is ejected from the cartridge through the outlet bore and onto the bristles of the toothbrush.

3,712,748

PAINT APPLICATOR

Stephen C. Wilmans, P.O. Box 1263, Avaneda D. Acacias, Rancho Santa Fe, Calif.

Filed Dec. 30, 1970, Ser. No. 102,670
Int. Cl. B44d *3/28*
U.S. Cl. 401—197 1 Claim



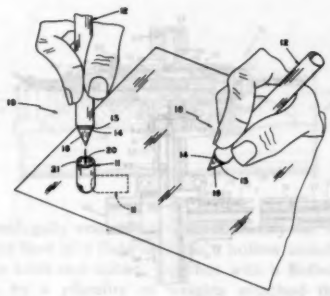
This invention is a paint applicator comprising a hollow cylindrically shaped relatively rigid tube being closed at both of its ends, but with opening means available to fill the cylinder with paint or the like and having means to accept a handle-holding mechanism to enable the cylinder to be rolled across a surface. The cylinder will normally be covered on its outside by a spreading material such as felt or the like and will have sufficient apertures interconnecting between the felt covering and the interior of the cylinder to allow constant feeding of the material within the cylinder to the applicating material. In its preferred form it will be further encased in an easily strippable material to avoid evaporation until it is used.

3,712,749

SELF-RIGHTING INSTRUMENT CAP DEVICE

Evan D. Roberts, 818 Elm, Flossmoor, Ill.

Filed Sept. 25, 1970, Ser. No. 75,622
Int. Cl. B43k *9/00*
U.S. Cl. 401—202 2 Claims



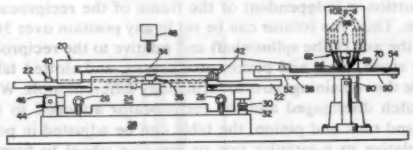
A writing instrument and cooperating cap therefore wherein the writing instrument has a cap receiving portion and the cap has an instrument receiving well, a specifically located center of gravity, and an outer curved surface.

3,712,750

INDEXING

James W. Healy, Wakefield, Mass., assignor to Cambridge Engineering Inc., Waltham, Mass.

Filed Dec. 24, 1970, Ser. No. 101,289
Int. Cl. B23q *35/128, 35/18*
U.S. Cl. 408—3 6 Claims

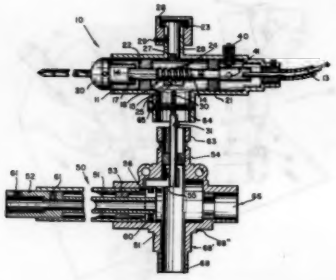


Improvement in worktable apparatus having X and Y drive units for producing relative table-to-tool movements along perpendicular X and Y axes, respectively; the improvement consisting of indexing and cycling mechanisms for controlling table-to-tool movement and cycling of a tool unit, comprising a template having at least one physical characteristic varying along both the axes in accordance with the desired pattern of the movement and the cycling; first and second sensors, the template and the sensors being mounted to undergo relative sensor-to-template movement in correspondence to the relative table-to-tool movement, the first sensor being responsive to a physical characteristic to provide table stop signals, the second sensor being responsive to a physical characteristic to provide table direction signals, one of the sensors being responsive to a physical characteristic to provide work cycle signals; and logic circuitry responsive to the sensors to cause the drive units to stop the relative movements in response to a table stop signal, to cause the tool unit to carry out the work cycle in response to a work cycle signal, and to cause the drive units to renew the relative movements in accordance with the table direction signals or hold the stop position in the absence of table direction signals.

3,712,751
MULTIPLE PURPOSE POWER TOOL FOR PORTABLE AND BENCH USE

William John Dietrich, 1327 Santa Fe Avenue, Modesto, Calif.

Filed May 20, 1971, Ser. No. 145,288
Int. Cl. B27c 9/00
U.S. Cl. 408—20 8 Claims



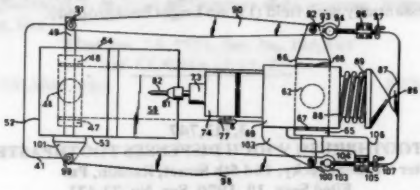
A power driven tool which provides rotary motion for drills and the like through a rotating shaft having a segment formed as worm threads. A worm gear provides a central aperture surrounded by teeth holes. A square spline formed at one end of a shaft extends through the aperture in the worm gear. A two-position clutch has teeth formed thereon adjacent the opposing teeth holes of the worm gear and has a squared bore to receive the splined end of the spline shaft. The clutch is disengaged when the clutch teeth are not inserted into the gear holes and is engaged to rotate with the gear when the teeth are in the holes and the splined shaft in the squared bore. The splined shaft will rotate with the clutch and gear when the clutch is engaged. The spline shaft has an eccentric cam formed at the other end. A cam follower is connected to a hollow tool holder which reciprocates upon rotation of the eccentric cam. The tool holder receives saws, files and the like and provides reciprocating motion thereto. The frame of the rotary portion is independent of the frame of the reciprocator portion. Thus, the rotator can be set in any position over 360° about the axis of the spline shaft and relative to the reciprocator. A stand, rack and pinion attachment, and slotted table provide the remaining parts to form many different tools. With the clutch disengaged and the reciprocator attached to the stand and rack and pinion, the table can be adjusted in position relative to a circular saw or grinding wheel to form a horizontal mill and grinding table, respectively. With the rotator connected to the stand and the clutch engaged, a blade saw attached to the reciprocator forms a vertical saw. By other combinations there is formed a drill press, circular table saw with straight or angle cut, power file, horizontal saw and file, and the like.

3,712,752
MACHINE TOOLS

John Maximilian Jules Varga, Skircoat Green, England, assignor to Carding Specialists Co. Limited, Halifax, England

Filed Nov. 20, 1970, Ser. No. 91,295
Claims priority, application Great Britain, Nov. 25, 1969, 57,537/69
Int. Cl. B23b 39/16, 47/00
U.S. Cl. 408—42 19 Claims

A machine tool having a work table mounted for pivotal movement about a first axis, a tool holder mounted for pivotal movement about a second axis and means for causing relative movement of the work table and tool holder towards and away from each other. Apart from this advancing movement all other movement is effected by pivoting rather than the use of conventional slideways. The two axes may be parallel and the work table and tool holder also mounted for pivotal movement about second and fourth axes perpendicular to and intersecting the first and third axes respectively. Connecting means

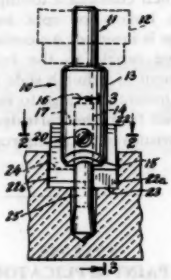


are described for moving the work table and tool holder through equal angles in the same sense about their parallel axes. This device is applicable to a plurality of tool holders surrounding a single work table or vice versa.

3,712,753
UNIVERSAL REPLACEABLE DRILL FOR MARBLE, METALS AND WOOD

Mathew Manzi, 38-66 13th Street, New York, N.Y.

Filed July 15, 1971, Ser. No. 162,875
Int. Cl. B23b 51/00, 51/16
U.S. Cl. 408—224 1 Claim



The present disclosure relates to a device forming the combination of two replaceable drills. One drill is meant to cut small holes and another for larger holes. Preferably the device in question may be used to cut holes in marble, stone, steel and wood. The invention provides a special design drill to cut the small holes and tool bit to cut the large holes. Both, the drill and the tool, may be readily removeable and replaceable from the device in question by drill or a tool bit of different size and manufacture.

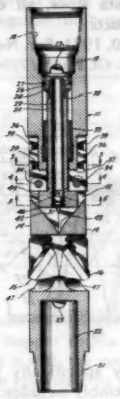
3,712,754
DOSING DEVICE

Geert Brouwer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1970, Ser. No. 94,872
Claims priority, application Netherlands, Dec. 5, 1969, 6918300
Int. Cl. F01d 1/36
U.S. Cl. 415—90 10 Claims

A dosing device for the pulse-free and continuous supply of very small quantities of medium per unit of time. A cylindrical rotor which can be coupled to a drive has a rotor capable of rotating with a very small amount of play in a cylinder surrounding it; the rotor or cylinder is provided with one or more shallow pumping grooves, each of which is situated in a plane transverse to the rotor axis. Each of said pumping grooves is interrupted in at least one place on the rotor circumference by

a dam, the cylindrical outer surface of which coincides with the cylindrical surface of the rotor cylinder. A medium supply



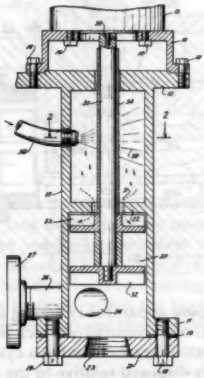
duct terminates on the one side of each dam in the relevant groove, and a medium discharge duct communicates with the relevant groove on the other side.

3,712,755

PUMP FOR LIQUIDS WHICH EMIT CORROSIVE FUMES

Walter J. Otto, Wantagh, N.Y., assignor to Julius L. Englesberg, Freeport, N.Y.

Filed June 24, 1971, Ser. No. 156,212
Int. Cl. F01d *11/00*; F04d *31/00*
U.S. Cl. 415—109 8 Claims



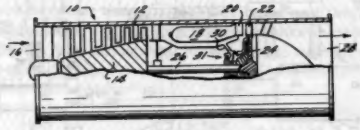
A pump including body having an inlet and an outlet. Upper and lower impellers rotate within the body, the lower impeller moving a liquid, which emits corrosive fumes, from the inlet to the outlet, and the upper impeller tending to move liquid downwardly toward the lower impeller. A liquid, e.g., water, having no corrosive fumes is sprayed into the pump body above the upper impeller to block the corrosive fumes which rise from the liquid being pumped by the lower impeller. The spray may be in the form of a mist or it may be a continuous liquid flow.

3,712,756

CENTRIFUGALLY CONTROLLED FLOW MODULATING VALVE

Irving Kalikow, Swampscott; Eliot Morton Sterling, Needham, and William Paul Anderson, Wenham, all of Mass., assignors to General Electric Company

Filed July 22, 1971, Ser. No. 165,168
Int. Cl. F01d *5/08*; G05d *13/10*
U.S. Cl. 415—175 8 Claims



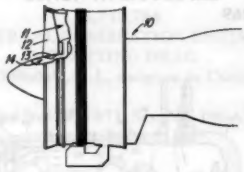
A centrifugally controlled valve assembly for modulating the rate of flow of a fluid includes a hollow annular housing having an inlet and outlet, together with a Bellville washer modified by a plurality of weights attached thereto and disposed within the annular housing for rotation therewith. Increased rotational speed operates to distort the geometry of the washer thereby changing the degree of obstruction which the washer presents to the rate of flow through the housing.

3,712,757

BLADED ROTORS FOR FLUID FLOW MACHINES

John Robert Goodwin, Ockbrook, England, assignor to The Secretary of State For Defence, in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 82,350, Oct. 20, 1970, abandoned. This application Jan. 7, 1972, Ser. No. 216,104
Int. Cl. B64c *11/14*
U.S. Cl. 416—245 11 Claims



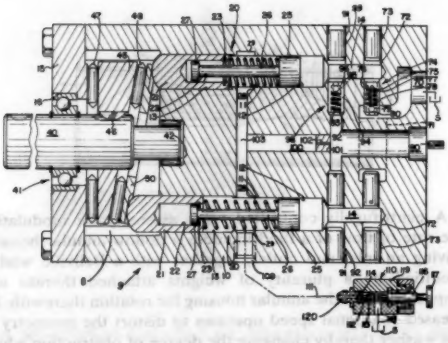
A part-annular spacer adapted to form part of a hub of a bladed rotor of fluid flow machine and to be interposed between adjacent blades of the rotor so as to space the blades apart. The spacer has axially opposite ends and comprises radially inner and outer circumferentially extending wall members and substantially radially extending wall means. The blades of said rotor are provided with substantially axially extending sealing means on the portions thereof adjacent the radial extents of each of said radial wall means on each of said spacers. The radially inner and outer circumferentially extending wall members are disposed adjacent to and secured to each other at the axially opposite ends of the spacer and are spaced from each other intermediate said ends. The substantially radially extending wall means being maintained in tension and extending radially between and secured to the circumferentially extending wall members so as to brace the latter together. The radial extents of each of said radial wall means are adapted to cooperate in sealing relationship with said sealing means provided on said blades.

3,712,758

VARIABLE DISPLACEMENT PUMP

Richard J. Lech, Hickory Hills, and Lawrence R. Reinbach, Westchester, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Sept. 10, 1970, Ser. No. 71,035
Int. Cl. F04b 27/08
U.S. Cl. 417—214 2 Claims



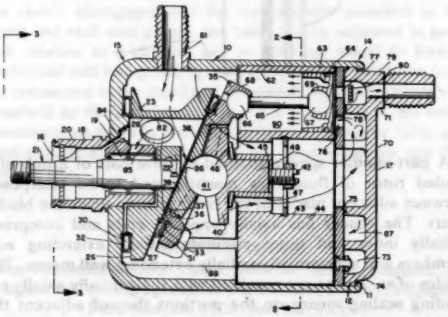
A pump unit for providing fluid energy having a housing with movable piston unit therein, mechanical means for directing power input to said piston unit, with hydraulic control means for controlling the fluid output from said unit.

3,712,759

LUBRICATING SYSTEM FOR MULTIPLE PISTON COMPRESSOR UNITS AND DRIVEN PARTS THEREOF

John W. Olson, Jr., Oklahoma City, Okla., assignor to John E. Mitchell Company, Dallas, Tex.

Continuation-in-part of Ser. No. 775,334, Nov. 13, 1968, Pat. No. 3,552,886. This application Jan. 4, 1971, Ser. No. 103,413. The portion of the term of this patent subsequent to Jan. 5, 1988, has been disclaimed.
Int. Cl. F04b 1/14, 27/08
U.S. Cl. 417—269 5 Claims



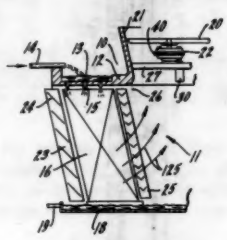
A multiple piston refrigerant gas compressor for use in air conditioning systems for vehicles in which the inlet of the compressor receives a mixture of refrigerant gas and oil in suspension that is impinged upon a novel rotor or swash plate, whereby the oil suspended in the refrigerant is separated by the centrifugal action of the rotor or swash plate and is distributed to the respective areas of the compressor requiring lubrication. The excess oil, if any, is slung outwardly by centrifugal force against the walls of the compressor housing.

3,712,760

FAN DRIVE ASSEMBLY

Donn B. Furlong, San Rafael; James F. Forchini, and Samuel Luzaich, both of Santa Rosa, all of Calif., assignors to Ecodyne Cooling Products

Filed May 10, 1971, Ser. No. 142,824
Int. Cl. F04b 17/00
U.S. Cl. 417—424 4 Claims



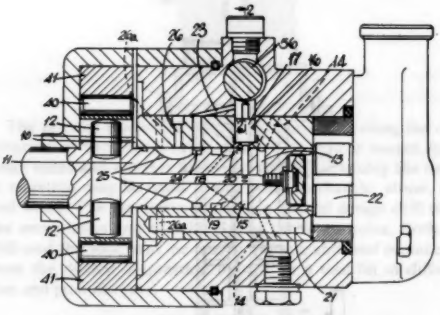
A fan drive assembly specifically designed for cooling towers. The fan drive assembly includes:
a fan means, having a plurality of blades associated therewith; a motor means for driving the fan means, positioned below the fan means within the stream of air flow; and a single reduction parallel shaft gear reducer means mounted immediately below the fan means for connecting the fan means to the motor means.

3,712,761

LIQUID FUEL INJECTION PUMPING APPARATUS

Dorian Farrar Mowbray, Burnham, England, assignor to C. A. V. Limited, Birmingham, England

Filed Oct. 2, 1970, Ser. No. 77,687
Claims priority, application Great Britain, Oct. 3, 1969, 48,628/69
Int. Cl. F04b 19/02
U.S. Cl. 417—462 3 Claims



A liquid fuel pumping apparatus including an axially movable shuttle, the extent of movement of which is limited by fluid pressure operable piston member having a cylindrical portion which is eccentrically disposed relative to the axis of the bore containing the piston member, the surface of the cylindrical portion defining a stop surface for the shuttle.

3,712,762

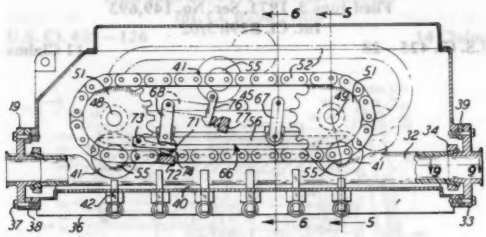
CONCRETE PUMP

Clarence E. Kenney, Racine, Wis., assignor to Arthur Hansmann, Racine, Wis., a part interest

Filed March 19, 1971, Ser. No. 126,089
Int. Cl. F04b 15/02, 43/08, 43/12
U.S. Cl. 417—477 5 Claims

A concrete pump having an elongated flexible hose for receiving the concrete, and having rollers which run along the

hose to squeeze the hose and thereby pump the concrete through the hose. The hose is disposed in a straight condition, and the rollers are moved along by a chain, and a guide rail positions the rollers against the hose for the squeezing of the



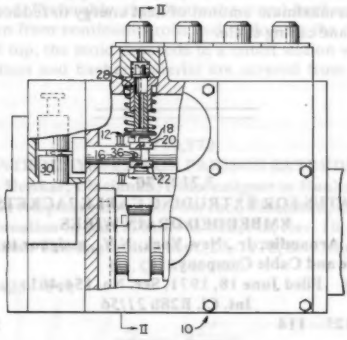
hose and the consequent pumping of the concrete through the hose. A gravity-feed hopper with a reciprocating piston fills the hose for charging it with the concrete. Spring-biased fingers assist the hose in regaining its tubular shape after it has been squeezed by the rollers.

3,712,763

SLEEVE METERING COLLAR ADJUSTING LEVER

John H. Parks, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 18, 1970, Ser. No. 73,464
Int. Cl. F04b *39/10*
U.S. Cl. 417—499 **3 Claims**



An adjusting lever for a sleeve metering collar on a plunger pump having a tang for cooperative insertion into an annulus in the collar for imparting movement thereto. The lever is bifurcated and mounted on a control shaft having an adjustment bore located therein. A tool having an eccentric projection adapted to be fitted within the bore serves to rotate the lever on the control shaft and thereby calibrate the sleeve metering collar.

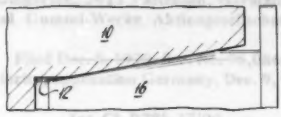
3,712,764

ADJUSTABLE CONSTRUCTION FOR MATING SURFACES OF THE ROTOR AND PORT MEMBER OF A LIQUID RING PUMP

Raymond S. Shearwood, Norwalk, Conn., assignor to Nash Engineering Company, South Norwolk, Conn.

Continuation of Ser. No. 833,442, June 16, 1969, abandoned.
Filed April 19, 1971, Ser. No. 135,341
Int. Cl. C11c *1/04*
U.S. Cl. 418—68 **8 Claims**

A liquid ring pump has a conical port member located within the corresponding central opening in the rotor and defines with the rotor a working clearance. Wear on the surfaces defining the working clearance reduces the efficiency of the pump. The present construction offers the ability to readjust the position of the port member so that the original



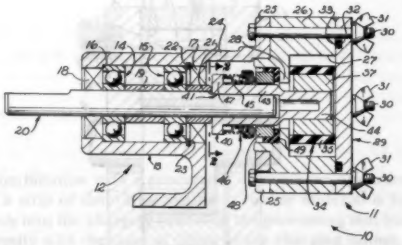
clearance between the port member taper and the rotor can be re-established, and the pump performance increased to its full capacity. This adjustment may be made without the disassembly of the pump.

3,712,765

FLUID HANDLING APPARATUS

Jozef R. Smith, Santa Ana, Calif., assignor to International Telephone and Telegraph Corp., New York, N.Y.

Filed April 3, 1970, Ser. No. 25,399
Int. Cl. F16j *15/54*; F01c *5/00*; F04c *5/00*
U.S. Cl. 418—70 **1 Claim**



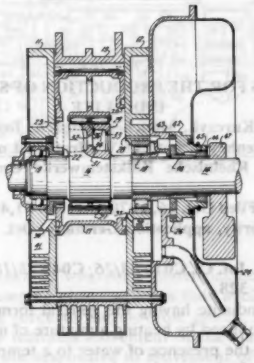
A rubber impeller pump including an annular seal. The seal is fixed to a drive cup so that the pump may be entirely dismantled for replacement or repair without disturbing or damaging the seal.

3,712,766

ROTARY INTERNAL COMBUSTION ENGINE WITH LOW STARTING DRAG

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation

Filed Nov. 8, 1971, Ser. No. 196,634
Int. Cl. F02n *15/00*
U.S. Cl. 418—88 **5 Claims**



A rotary internal combustion engine having provision to eliminate the oil pump drag during low temperature starting

by means of a slip-clutch cutting out the oil pump during conditions of high oil viscosity, and having bearings capable of running with only residual lubrication and without additional lubricant supply until the engine warms up.

3,712,767

SEALING ARRANGEMENT FOR ROTARY COMBUSTION ENGINE

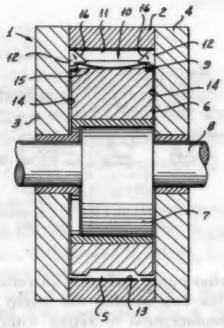
Karl Beutter, Heilbronn, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm and Wankel G.m.b.H., Lindau, Bodensee, Germany

Filed May 20, 1971, Ser. No. 145,442

Claims priority, application Germany, June 3, 1970, P 20 27 115.2

Int. Cl. F01c *19/02*; F03c *3/00*; F04c *27/00*

U.S. Cl. 418—121 7 Claims



A sealing arrangement for the apexes of the rotor of a rotary combustion engine, wherein the inner surface of the peripheral housing, the end walls, and the parts of the seal are of different graduated hardnesses, whereby the seal rapidly wears into a perfect fit and sealing engagement without danger of scoring or abrading the housing.

3,712,768

PROCESS FOR THE PRODUCTION OF SYNTHETIC INDIALITE

Heinz-Georg Kurczyk, Monchengladbach; Josef Wuhrer, and Adrian Ottenheym, both of Wulfrath, all of Germany, assignors to Rheinische Kalksteinwerke GmbH, Wulfrath, Germany

Filed Oct. 16, 1970, Ser. No. 81,498

Claims priority, application Germany, Oct. 14, 1970, P 19 52 572.5

Int. Cl. C01b *33/26*; C04b *35/18*

U.S. Cl. 423—328 8 Claims

Synthetic indialite having the general formula $2MgO{\cdot}2Al_2O{\cdot}5SiO_2$ is produced by heating a mixture of magnesia, kaolin and quartz in the presence of water to a temperature of 170° to 230° C., dehydrating the mixture at a temperature above 850° C., and then firing the dehydrated product at a temperature above 1,100°C.

3,712,769

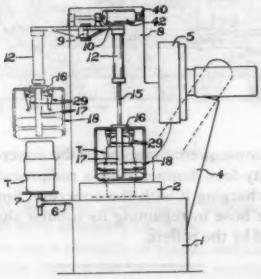
FIRE LOADING APPARATUS WITH PREHEATING DEVICE FOR GREEN TIRES

Francis J. Cimprich, Canton, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed June 3, 1971, Ser. No. 149,693

Int. Cl. B29h *5/02*

U.S. Cl. 425—28 11 Claims



The preheating of selective thickest portions of a green tire as in the shoulder regions of a green tire as by a radiant heater to condition the green tire for vulcanization such that the green tire when vulcanized by the molding press receives and utilizes its maximum amount of heat energy to reduce the vulcanizing and curing cycle.

3,712,770

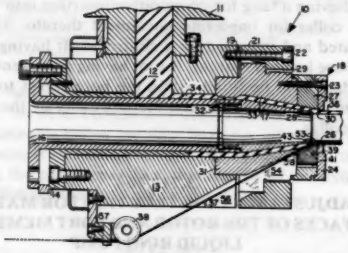
APPARATUS FOR EXTRUDING CABLE JACKETS WITH EMBEDDED DRAIN WIRES

Edwin H. Arnaudin, Jr., New York, N.Y., assignor to Anaconda Wire and Cable Company

Filed June 18, 1971, Ser. No. 154,481

Int. Cl. B28b *21/56*

U.S. Cl. 425—114 5 Claims

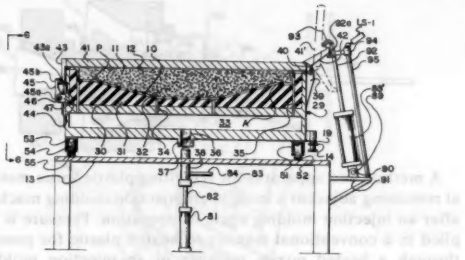


Apparatus for extruding a cable jacket with embedded drain wires comprises a die with radial recesses into which are fitted hardened guide blocks with passages for the wires.

3,712,771
TRAVELING MOLD MECHANISM FOR FORMING PLASTIC ARTICLES

James C. White, Gladwin, and Gene F. Emge, Bay City, both of Mich., assignors to Koehring Company

Filed June 24, 1971, Ser. No. 156,333
Int. Cl. B29d 27/04
U.S. Cl. 425—126 14 Claims

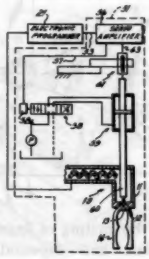


A mold system in which molds are indexed along a continuous circuit past stations at which: a deformable plastic sheet is first applied over the mold cavity or cavities; suction forces are applied to bring the sheet into the mold cavity or cavities; expandable plastic foam is applied to the formed sheet cavity; a backer is applied to close the cavity or cavities in which the expandable material is received; expansion and curing of the foam occurs; and finally the articles formed are unloaded. Each mold can be provided with a lid or closure which is opened at the unloading station and remains open until a backer or closure material is applied, at which time it is closed and locked. Preferably, the plastic sheet and backer material are drawn from continuous rolls and, following the closing of the mold top, the mold proceeds to a cutoff station where the plastic sheet and backer material are severed from the rolls thereof.

3,712,772
CONTROL SYSTEM FOR PARISON EXTRUDERS

Denes B. Hunkar, Cincinnati, Ohio, assignor to Hunkar Instrument Development Laboratories, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 875,448, Nov. 10, 1969, abandoned. This application Sept. 23, 1970, Ser. No. 74,644
Int. Cl. B29f 3/00
U.S. Cl. 425—141 33 Claims

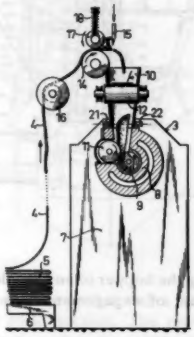


An electronic control for a parison extruder. The system is effective to control either symmetrical or asymmetrical variations in parison wall thickness. The control system includes a matrix-type patch board in which the desired thickness is set up for each interval of the extrusion cycle. The patch board signals are scanned by an electronic timer and a transistor switching circuit so that a control signal is generated for each sequential interval of the extrusion cycle. These control signals are applied to a servo amplifier which in turn controls a servo valve for changing the relative position between a mandrel and die opening of the extruder.

3,712,773
DEVICE FOR FEEDING PLASTIC RUBBER OR SYNTHETIC RUBBER MIXTURES TO PROCESSING MACHINES

Wilfried Baumgarten, 3011 Pattensen, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Dec. 8, 1970, Ser. No. 96,086
Claims priority, application Germany, Dec. 9, 1969, P 19 61 632.1
Int. Cl. B78b 17/00
U.S. Cl. 425—142 3 Claims

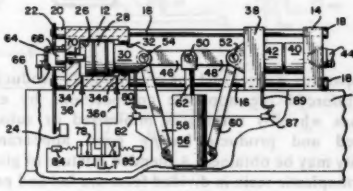


In combination with a processing machine, an apparatus in which a strip of natural or synthetic rubber material is fed at intervals into the charging funnel of the processing machine in conformity with the state of filling of the charging funnel, and in which between said feeding intervals a section of the strip of rubber material adjacent said charging funnel is cut off.

3,712,774
MOLDING MACHINE HAVING YIELDABLY RESTRAINED CLAMPING FORCE APPLYING ELEMENT

Henry R. Parker, New Boston, N.H., assignor to Improved Machinery Inc., Nashua, N.H.

Filed Oct. 14, 1970, Ser. No. 80,660
Int. Cl. B29f 1/00
U.S. Cl. 425—154 13 Claims



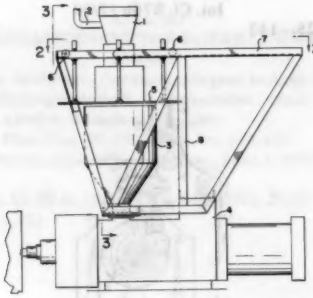
A molding machine wherein a platen includes a cylinder containing a clamping piston which is fluid actuatable for applying clamping force to the movable platen, and a second piston yieldably restrains movement of the clamping piston. Control means are responsive to movement of the clamping piston against the yieldable restraint of the second piston to prevent supply of actuating fluid to the clamping piston.

3,712,775

HOPPER LOADING EXTRUSION APPARATUS

Dorothy J. Duker, Fort Worth, Tex., assignor to Vistron Corporation, Cleveland, Ohio

Filed April 16, 1971, Ser. No. 134,714
Int. Cl. B29f 3/01
U.S. Cl. 425—186 3 Claims



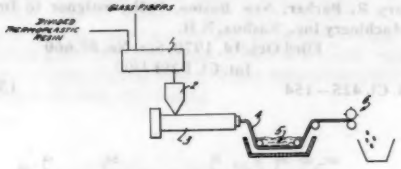
A device for loading the hopper of an extruder which is easily moved into and out of engagement with the top of the hopper is described.

3,712,776

APPARATUS FOR THE CONTINUOUS PRODUCTION OF GLASS FIBER REINFORCED THERMOPLASTIC

George W. Woodham, and James L. Stuart, Evansville, Ind., assignors to Dart Industries, Los Angeles, Calif.

Division of Ser. No. 872,683, Oct. 30, 1969, Pat. No. 3,655,850. This application July 6, 1971, Ser. No. 159,854
Int. Cl. B01f 7/08
U.S. Cl. 425—202 7 Claims



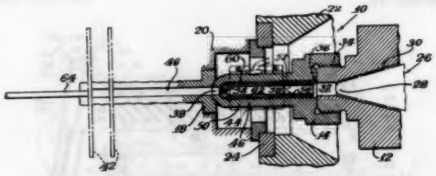
An apparatus is disclosed for continuously producing glass fiber reinforced thermoplastic compositions by extrusion techniques whereby surging is minimized or substantially eliminated and products having good appearance and uniformity may be obtained. A blended mixture of glass fibers and thermoplastic resin in divided form are fed and processed through an extruder equipped with a multi-flight screw which provides for two stages, each state including a feed zone, transition zone and metering zone and wherein the compression ratio in the first stage is in the range of about 3:1 to 5:1, the compression ratio in the second stage is in the range of about 1.5:1 to about 3.5:1, and the ratio between the flight depth of the screw in the second stage feed zone and the flight depth of the screw in the first stage feed zone is in the range of about 1:1.25 to about 1:2.5. The mixture is continuously extruded under the above conditions, cooled to solidification, and subdivided into the desired size. The resulting compositions are particularly suitable for molding operations.

3,712,777

APPARATUS FOR REMELTING SPRUE MATERIAL

Kenneth E. Sherer, Richmond, Ind., assignor to National Automatic Tool Company, Incorporated, Ind.

Filed June 1, 1971, Ser. No. 148,630
Int. Cl. B29c 29/00; B29h 19/00
U.S. Cl. 425—217 10 Claims



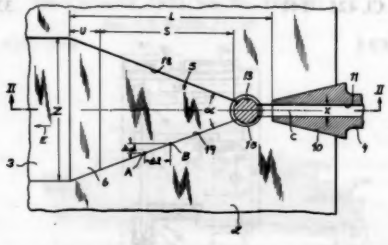
A method and apparatus for remelting plastic sprue material remaining adjacent a mold in an injection molding machine after an injection molding cycle of operation. Pressure is applied in a conventional manner to heated plastic for passage through a heated nozzle member in an injection molding machine. The nozzle contains a shuttle member which is moved to an injection position as the melted heated plastic is passed through the nozzle and the shuttle member, through a sprue line and then to the mold cavity. After the plastic solidifies in the mold cavity, a sprue removal pin is passed through the sprue line so as to remove the waste material or sprue material from the sprue line. This movement of the sprue removal pin moves the sprue back towards the nozzle and the sprue moves the shuttle member to a retraction position. The sprue then passes through a second path of travel which is past the heated portion of the nozzle for reheating and remelting the sprue material for later use thereof in an injection molding cycle.

3,712,778

MOLD FOR THE CASTING FOR FOAMABLE SYNTHETIC RESINS

Rolf Lidl, 8000 Munich 12, Germany, assignor to Krauss-Maffei AG, Munich-Allach, Germany

Filed Dec. 10, 1970, Ser. No. 96,749
Claims priority, application Germany, Dec. 11, 1969, P 19 62 008.7
Int. Cl. B29f 1/00
U.S. Cl. 425—242 10 Claims



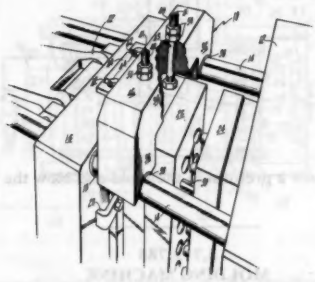
A mold or form for the casting of foamable or expandable synthetic-resin materials and especially multicomponent materials, containing two or more interreacting substances adapted to copolymerize to form the cast body, has a mold cavity and an inlet passage communicating between this cavity and the nozzle of the molding machine (e.g. an injection-molding apparatus). The passage has an inlet portion of generally circular cross-section and fans outwardly to a discharge portion in the form of a narrow slit of a height of 0.2 to 2mm extending over the major portion of the width of the cavity to the point at which the discharge slit communicates with the latter. In addition, the height of the passage tapers downwardly to impart a wedge configuration in a plane of the passage perpendicular to the major dimension of the slit.

3,712,779

POSITION ADJUSTING BAR FOR INJECTION MOLDING MACHINE

David E. Luginbuhl, Rockville, Conn., assignor to Appollo Plastic & Machine Co., Bolton, Conn.

Filed Jan. 25, 1971, Ser. No. 109,380
Int. Cl. B29f 1/00
U.S. Cl. 425—242 6 Claims



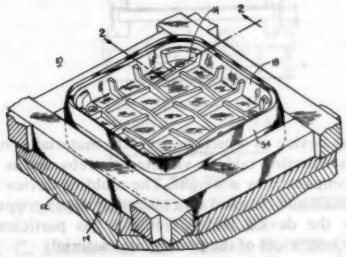
A position adjusting bar is provided for the movable mold block of a vertical platen injection molding machine. The position adjusting bar is a U-shaped member secured to the movable platen for travel therewith and includes vertically adjustable linkages connected to the movable mold block for raising and lowering the block relative to the bar, thereby effecting accurate and positive alignment between the stationary and movable mold blocks.

3,712,780

IMPROVED MOLDING APPARATUS FOR SIMULTANEOUSLY FORMING PLURAL ARTICLES

Bruce T. Jope, South Glastonbury, Conn., and Alan R. Phillips, Monson, Mass., assignors to Monsanto Company, Saint Louis, Mo.

Filed Sept. 25, 1969, Ser. No. 860,862
Int. Cl. B29c 17/14
U.S. Cl. 425—291 8 Claims



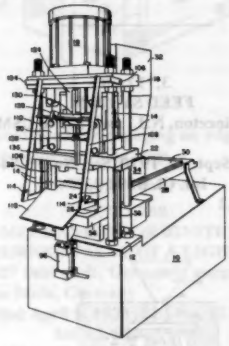
An improved mold assembly for simultaneous thermoforming of plural articles from sheet material, wherein mold and/or cutting components are individually replaceable without dismantling major portions of the assembly. The individual molds are secured in the assembly through the article forming surfaces of the mold cavities, with the means for securing the molds, such as screws, having end faces which serve as portions of the forming surfaces of the molds. Depressions in these end faces form stacking lugs in the molded articles.

3,712,781

MOLDING PRESS

Jacob Schmier, Allentown, Pa., assignor to Rodale Manufacturing Company, Inc., Emmaus, Pa.

Division of Ser. No. 806,776, Feb. 25, 1969, Pat. No. 3,614,810. This application Dec. 3, 1970, Ser. No. 97,459
Int. Cl. B30b 15/32
U.S. Cl. 425—161 6 Claims



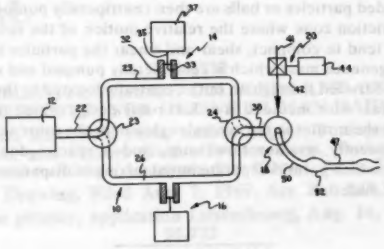
A molding press is provided with a stationary mold section and a movable mold section. The movable section carries mechanism operative when the mold is opened for ejecting a workpiece from the mold. Additional mechanism is arranged for projection into the mold cavity for forming a recess in the side of the workpiece and for being withdrawn from the mold cavity in time to permit ejection of the workpiece from the mold cavity. Latch mechanism, operable in response to opening and closing of the mold, is provided for suitably controlling means which receives work ejected from the mold and discharges it from the press.

3,712,782

EXTRUDER

Norbert W. Burlis, St. Louis, Mo., assignor to Sherwood Medical Industries Inc.

Filed Feb. 25, 1971, Ser. No. 118,859
Int. Cl. B29f 3/06
U.S. Cl. 425—380 8 Claims



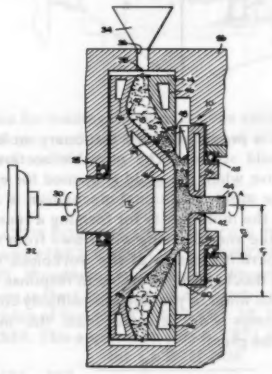
An extruding apparatus for producing tube products, such as medical catheters, having very accurately controlled variations in inside diameter, outside diameter and wall thickness along their length, including a single extruder for producing plastic material and conveying the same selectively to either of two accumulator-injectors through a diverting valve. The accumulator-injectors are connected to deliver molten plastic selectively in their inject strokes to an extruding die through another diverting valve. The apparatus is constructed so that while the extruder is feeding molten plastic to one accumulator-injector, the other is connected to inject molten plastic

into the die by appropriately positioning the die connected diverting valve. The very accurate control over the speed of each of the accumulator-injectors during their inject phases accompanied by accurate control of air flow to the die interior provide contour tubing having extremely close tolerances rendering such tubing capable of mass production quantities. Other embodiments of the present invention achieving the same objectives are described below.

3,712,783
FEED SYSTEM

Bryce Maxwell, Princeton, N.J., assignor to USM Corporation, Boston, Mass.

Filed Sept. 25, 1970, Ser. No. 75,544
Int. Cl. B29d *23/04*
U.S. Cl. 425—381.2 **5 Claims**



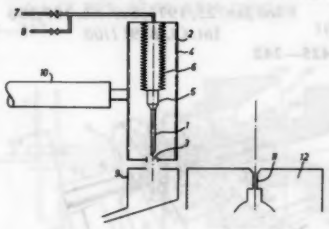
An elastic melt extruder for processing visco-elastic plastic material is provided with a peripheral inlet leading into a diverging feed zone in the processing gap formed between the rotor and stator walls. As the plastic particles are sheared, tumbled and heated in the diverging feed region, they grow in size, as by forming balls of partially compacted material. The expanded particles or balls are then centripetally pumped into a restriction zone where the relative motion of the rotor and stator tend to compact, shear and smear the particles into an homogeneous mass which is centripetally pumped and caused to be extruded through an outlet centrally located in the rotor or stator. Also included is a dual-rotor design which permits higher shear rates in the central region near the rotor axis, and consequently, greater flow rates, and a special dual-rotor design which permits separate initial mixing of disparate visco-elastic materials.

3,712,784
APPARATUS FOR BLOW MOLDING A PREFORM IN A MOLD WITH A STERILE GAS

Michael Siard, 2, Route du Cap, 76 Sainte Adresse, and Daniel Pellerin, 11, rue J. Siegfried, 76 Le Havre, both of France

Filed March 26, 1971, Ser. No. 128,469
Claims priority, application France, Mar. 27, 1970, 7011123
Int. Cl. B29d *23/03*
U.S. Cl. 425—387 **4 Claims**

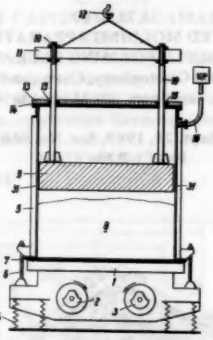
A needle is retracted into a sterilization chamber where it undergoes heating to a sterilization temperature while a sterile gas is passed through the needle. The sterilized needle is then passed to a position above a mold and the needle is then extended to pierce a preform in the mold and blow the preform in the mold.



3,712,785
MOLDING MACHINE

Wilhelm Hirt, Norf Rhine; Heinz Ringelmann, Nievenheim; Ernst Weckesser, Grevenbroich, and Weinhold Gottfried, Norf Rhine, all of Germany, assignors to Vereinigte Aluminium Werke Aktiengesellschaft, Bonn, Germany

Division of Ser. No. 852,730, Aug. 25, 1969, abandoned. This application Feb. 4, 1971, Ser. No. 112,656
Claims priority, application Germany, Sept. 4, 1968, P 17 58 927.4
Int. Cl. B30b *11/02*
U.S. Cl. 425—405 **8 Claims**



A molding device in which particulate material contained therein on a vibrating table is vibrated thereby and is simultaneously compacted by a weight. The molding device is hermetically sealed and coupled to a source of vacuum operative to evacuate the device and to remove gas particles from between the interstices of the particulate material.

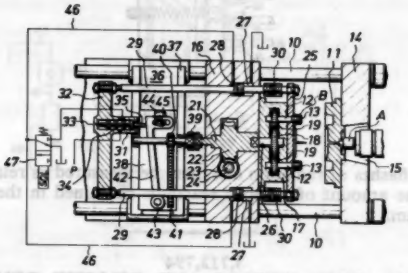
3,712,786
DEVICE FOR EJECTING IN INJECTION MOLDING OF THREADED ARTICLES

Katashi Aoki, 6037, Oaza Minamijo, Sakaki-machi, Hanishina-gun, Nagano-ken, Japan

Filed Feb. 3, 1971, Ser. No. 112,225
Claims priority, application Japan, Feb. 4, 1970, 45/9439
Int. Cl. B29f *1/14*
U.S. Cl. 425—438 **5 Claims**

A method for ejecting in injection molding of threaded articles wherein a movable mold clamping plate is provided with a

shaft adapted to rotate threaded cores and a plurality of rods movably supporting a stripper plate arranged around said cores, thus permitting to release threaded molded articles from the cores by rotation thereof and forward movement of said stripper plate after mold opening, said forward movement being realized under pressure of the oil forced into the rods



simultaneously with revolution of the rotating shaft, said stripper plate being moved at a velocity corresponding to the lead of screw thread of the cores by a combined action of a cam adapted to be actuated synchronously with the cores by revolution of said rotating shaft to me in one direction, said cam being set at a desired angle, and a stylus provided in contact with said model cam at the rear of said rods.

3,712,787

APPARATUS FOR MOULDING HELMET SHELLS AND THE LIKE

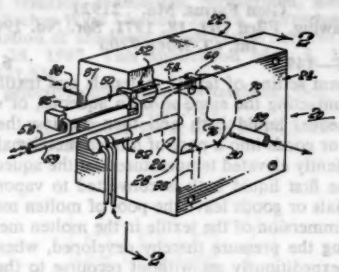
Ralph Barnes, 18909 Anelo Avenue, Gardena, Calif.

Division of Ser. No. 97,619, Dec. 14, 1969. This application Nov. 15, 1971, Ser. No. 199,057

Int. Cl. B29c *7/00;* **B29f** *1/14*

U.S. Cl. 425—438 **1 Claim**

Injection moulding apparatus for moulding helmet shells forms the shells upon a rigid core from which they are removed by a reciprocable ejector slide provided with a



pivotally mounted head for engaging an edge of the shell and fulcruming it upon the opposite edge.

3,712,788

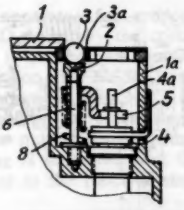
ACTUATING MECHANISM FOR IGNITION SYSTEM AND BURNER VALVE OF A LIGHTER

Willi Solzer, 627 Stierstadt, Germany, assignor to Braun AG, Frankfurt am Main, Germany

Filed April 8, 1971, Ser. No. 132,449

Int. Cl. F23q *25/00*

U.S. Cl. 431—150 **9 Claims**



An arrangement of an actuating mechanism of a lighter is disclosed wherein a burner valve lifter is slidably supported for axial movement in guide means. This axial movement and thus the opening or the closing of the burner nozzle is controlled by a cam follower member formed in the actuating member.

CHEMICAL

ERRATUM

For Class 8—11 see:
Patent No. 3,712,158

3,712,789

FLAME RETARDANT COMPOSITION FOR TEXTILES

Roger C. Linderman and Charles D. Cline, Charlotte, N.C., assignors to Story Chemical Corporation, Athens, Ga.

No Drawing. Continuation-in-part of application Ser. No. 17,894, Mar. 9, 1970, now Patent No. 3,640,823, dated Feb. 8, 1972. This application Jan. 3, 1972, Ser. No. 215,080

Int. Cl. D06m *15/64, 13/26, 13/44*

U.S. Cl. 8—116 P **14 Claims**

The flame retardancy of textile fabrics is enhanced through treatment with a composition comprising an aziridinyl phosphine oxide or sulfide and a phosphoric amide such as phosphoric triamide.

3,712,790

2,6-DIMETHYL PHENOL COUPLERS AND OXIDATION DYES FOR DYEING HUMAN HAIR

Gregoire Kalopissis, Paris, Andree Bugaut, Boulogne-sur-Seine, and Hubert Gaston-Breton, Paris, France, assignors to Societe Anonyme dite: l'Oreal, Paris, France

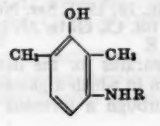
No Drawing. Filed Aug. 7, 1969, Ser. No. 848,329

Claims priority, application Luxembourg, Aug. 14, 1968, 56,722

Int. Cl. A61k *7/12*

U.S. Cl. 8—10.2 **6 Claims**

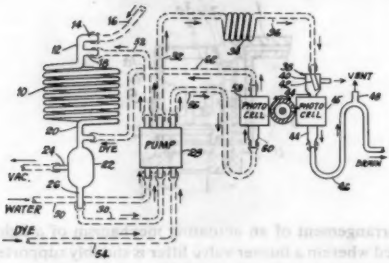
Oxidation dye coupling compounds for use in dyeing live human hair having the formula:



3,712,791
PRESSURE STEAM SETTING PROCESS
Martin S. Maltenfort, Rte. 3, Box 23, Glen Farms, Md. 21921
No Drawing. Filed Oct. 18, 1971, Ser. No. 190,324
Int. Cl. D06p 7/00
U.S. Cl. 8—149.1 6 Claims

The steam setting of textile materials and textile goods by first contacting the same with an aqueous, or substantially aqueous, liquid bath and then passing the textile materials or goods into a pool of molten metal maintained at a sufficiently elevated temperature that the aqueous portion of the first liquid bath is converted to vapor before the materials or goods leave the pool of molten metal, the depth of immersion of the textile in the molten metal pool determining the pressure thereby developed, whereby the textile is expeditiously set without recourse to the use of external superatmospheric pressures.

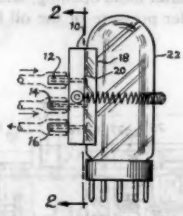
3,712,792
COLORIMETER WITH GAS SCRUBBER ASSEMBLY
Norman A. Lyshkow, Chicago, Ill., assignor to Pollution Monitors, Inc., Chicago, Ill.
Original application June 15, 1970, Ser. No. 46,308, now Patent No. 3,617,126. Divided and this application Apr. 8, 1971, Ser. No. 132,613
Int. Cl. G01n 21/06, 31/06; B01d 47/00
U.S. Cl. 23—254 R 6 Claims



A colorimeter for determining the concentration of gaseous pollutants in air and improved scrubber and photocell assemblies for use with such colorimeters, wherein the scrubber includes a helical coil into which an air sample is drawn and admixed with a liquid absorbent whereby the liquid flows gravitationally through the coil in the form of wave fronts to provide complete contact between the air sample and the liquid absorbent with minimum agitation, and the photocell assembly includes a pair of spaced photoresistors and a light source spaced therebetween, with the light source having a lamp housing enclosing the light source and defining a pair of spaced openings whereby the light source projects optical spots to the photoresistors to illuminate the photoresistors with light, the relative intensity of which is dependent upon the color developed in solutions passed in front of the photoresistors as an indication of the pollutant gas concentration in the air sample.

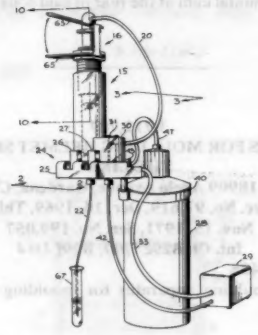
3,712,793
METHOD AND APPARATUS FOR ANALYSIS OF GAS STREAMS
Norman A. Lyshkow, 722 W. Fullerton, Chicago, Ill. 60614
Filed Aug. 16, 1971, Ser. No. 172,133
Int. Cl. G01n 21/26
U.S. Cl. 23—232 E 27 Claims

Method and apparatus for the detection and/or analysis of a gas stream in which a gaseous reactant is passed as a thin layer through a tortuous path to generate a highly turbulent flow for contact with a coreactant in the form of a solid, liquid or gas in a surface reaction to produce flashes of radiation by chemiluminescence.



The flashes of radiation can then be measured as relating to the amount of gaseous reactants contained in the gas stream.

3,712,794
LABORATORY PIPETTE AND DILUTER DEVICE
Andrew F. Farr, Spring Valley, Calif., assignor to Farr Devices Inc., Spring Valley, Calif.
Continuation-in-part of application Ser. No. 769,825, Oct. 23, 1968. This application Jan. 26, 1971, Ser. No. 109,758
Int. Cl. B01l 3/02; G01f 11/28
U.S. Cl. 23—259 1 Claim

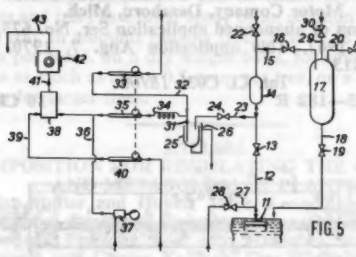


A laboratory apparatus for semi-automatically accurately measuring out a volume of diluting reagent and also accurately measuring out a volume of a liquid sample for analysis, and for discharging both liqids into a reaction vessel, with pre-set or adjustable volumes for both liquids. The operation is effected by means of a small motor driven air pump which provides air at increased or reduced pressures as required, and an air-permeable but hydrophobic porous membrane serves to fix the liquid level in the measuring pipette.

3,712,795
METHOD FOR SAMPLING PLANT FLUIDS
Wilfred Charles Hamshere, Holmrook, and Thomas William Lancaster Atkinson, Whitehaven, England, assignors to Marchon Products Limited, London, England
Original application Oct. 11, 1967, Ser. No. 674,495. Divided and this application Feb. 3, 1971, Ser. No. 112,382
Claims priority, application Great Britain, Oct. 14, 1966, 46,171/66
Int. Cl. B01d 23/24; G01n 21/02, 21/26
U.S. Cl. 23—230 R 8 Claims

An automatic method for the sampling of plant fluid containing suspended fine solids to provide a substantially continuous supply of clear fluid for analysis. The

composition of the fluid is substantially continuously monitored. The process comprises (A) repeatedly and sequentially (i) withdrawing a sample stream of fluid from the plant; (ii) filtering said sample stream, whereby a filter cake accumulates and the filtered sample stream is initially cloudy and subsequently becomes clearer as the filter cake accumulates; (iii) isolating the clearer portion of the filter sample to obtain clear sample fluid; (iv) dispersing the filter cake by backwashing; (B) collecting successively isolated portions of said clear sample fluid to provide a supply of clear freshly filtered fluid in a holding vessel; (C) simultaneously, and substantially continuously, withdrawing fluid from the supply in said holding vessel; and (D) analysing said withdrawn fluid.



3,712,796
HEAT SHIELD FOR CHEMICAL WASTE INCINERATOR

William Sansom, Hendersonville, Tenn., and Fred W. Thompson, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

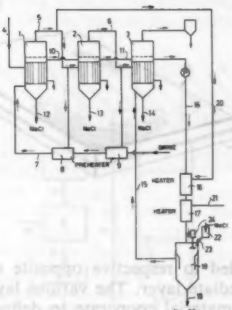
Filed Feb. 25, 1971, Ser. No. 118,804
Int. Cl. C01b *7/08;* C10b *1/04;* F23m *9/00*
U.S. Cl. 23—277 C 14 Claims

In a chemical waste incinerator having a combustion chamber lined with a refractory material in communication with a spray quench chamber lined with a corrosion resistant material, such as carbon blocks, and an annular heat shield at the juncture of the combustion chamber and quench chamber, there is provided an improvement wherein the heat shield consists essentially of a corrosion resistant outer layer separated from a heat resistant inner layer by a resilient insulating barrier of high thermal efficiency.

3,712,797
PROCESS FOR EVAPORATING NaCl BRINE TO SEPARATE NaCl CRYSTALS FROM Na_2SO_4

Robert Winkler, Wallisellen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Continuation of abandoned application Ser. No. 671,421, Sept. 28, 1967. This application Mar. 5, 1971, Ser. No. 121,530
Claims priority, application Switzerland, Oct. 17, 1966, 15,053/66
Int. Cl. B01d *9/02;* C01d *3/08, 5/16*
U.S. Cl. 23—296 5 Claims



Process and apparatus for evaporating NaCl brine containing Na_2SO_4, whereby the crystallisation of NaCl from the brine is carried out practically to saturation of the mother liquor with Na_2SO_4, and then the mother liquor is undersaturated with NaCl by being heated to a higher temperature, whereupon steps are taken for resaturation of the mother liquor with NaCl, the N_2SO_4 then precipitating is separated, and the residual mother liquor is returned to the NaCl crystallisation process.

3,712,798
CHROMIUM BORIDE COATED ARTICLES

Ray J. Van Thyne, Oak Lawn, and John J. Rausch, Antioch, Ill., assignors to Surface Technology Corporation, Stone Park, Ill.

No Drawing. Continuation-in-part of application Ser. No. 671,189, Sept. 28, 1967. This application Jan. 6, 1970, Ser. No. 1,054
Int. Cl. C23c *11/08*
U.S. Cl. 29—195 A 5 Claims

A material having an outer layer of chromium boride formed on an intermediate sublayer of essentially pure chromium on a substrate. The chromium layer and the diffusion zone between the chromium and substrate serve as a thermal expansion mismatch accommodation region to minimize cracking of the chromium boride layer. The chromium layer serves as a secondary corrosion barrier at the base of minor cracks sometimes formed in the outer chromium boride layer. In the preferred embodiments we produce a crack-free chromium boride layer by selecting a substrate material which is expansion matched therewith. The present materials have particular utility on temperature sensing devices in molten aluminum.

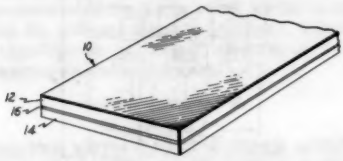
3,712,799
COMPOSITE THERMOSTAT MATERIAL

Jacob L. Ornstein, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1970, Ser. No. 100,006
Int. Cl. B23p *3/00*
U.S. Cl. 29—195.5 1 Claim

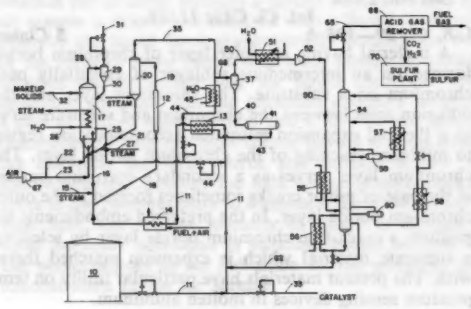
A relatively low cost, multi-layer composite thermostat material is disclosed having preselected electrical resistivity and flexivity characteristics including first and second

outer layers of metallic alloys having relatively high and relatively lower coefficients of thermal expansion and an intermediate layer of a ferrous alloy. The first outer layer of metallic alloy comprises a material comprising by weight approximately 71% to 76% manganese, 9% to 19% copper, and 9% to 17% nickel, while the second outer layer comprises a metallic alloy such as the material commonly referred to as Invar, which comprises by weight approximately 35½% to 36½% nickel and the balance iron. The first and second outer layers are metal-



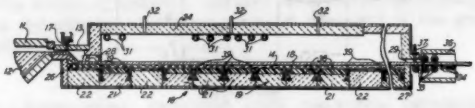
lurgically bonded to respective opposite surfaces of the ferrous intermediate layer. The various layers comprising the composite material cooperate to define an extremely economical, composite thermostat material having resistivity characteristics suitable for many applications, while having requisite characteristics of flexivity, useful deflection temperature range, structural strength and ability to withstand high temperatures comparable to previously available thermostat materials only obtainable at substantially higher costs.

3,712,800
METHOD FOR CONVERTING RESIDUAL OILS INTO FUEL GAS
August H. Schutte, Lexington, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.
Filed Sept. 4, 1970, Ser. No. 69,770
Int. Cl. C07c *3/00, 9/04*
U.S. Cl. 48—197 R **4 Claims**



Method and apparatus for converting residual hydrocarbon oils to a fuel gas which has essentially the same heating value and density as natural gas and which may therefore be distributed through the same lines. The residual oil containing one or more metallic modifiers as catalysts, which may be naturally occurring in the oil or added thereto, is pyrolyzed at low temperatures (up to 1400° F.) and low pressures (up to about 30 p.s.i.g.); and from the products of pyrolysis a fuel gas is separated. The fuel gas is a mixture of methane, hydrogen and ethane/ethylene wherein the molar ratio of hydrogen to ethane/ethylene is about one-to-one.

3,712,801
FLOAT GLASS CHAMBER HAVING THIN-LAMINATED CARBON BOTTOM
Walter R. Schlehr, Dearborn, Mich., assignor to Ford Motor Comany, Dearborn, Mich.
Continuation of abandoned application Ser. No. 673,435, Oct. 6, 1967. This application Aug. 7, 1970, Ser. No. 62,213
Int. Cl. C03b *18/00*
U.S. Cl. 65—182 R **10 Claims**



A substantially enclosed chamber utilized in the float process of manufacturing flat glass contains refractory to define a cavity in which a molten metal bath is supported. Molten glass is flowed out upon the bath and solidified as it passes along the length of the chamber to produce a ribbon of glass. The refractory defining the bottom of the cavity is lined in certain zones thereof with slabs of carbonaceous material and in other zones thereof a thin layer of carbonaceous material is laminated to the refractory. The utilization of the laminated refractory provides protection for the refractory from engagement thereof by the glass ribbon and also provides a means for interrupting conductive heat transfer along the length of the chamber through solid liner blocks of carbonaceous material.

3,712,802
COMPOSITION AND METHOD FOR TREATING PLANTS AND TREES
Roland S. Grybek and Frederick B. Johnston, Tampa, Fla., assignors to Marketing and Research Services, Inc., Coral Gables, Fla.
No Drawing. Continuation-in-part of applications Ser. No. 417,215, Dec. 9, 1964, and Ser. No. 804,717, Mar. 5, 1969. This application June 2, 1969, Ser. No. 829,771
Int. Cl. A01n *5/00*
U.S. Cl. 71—79 **10 Claims**

A growth promoting composition influencing growth and yield of ornamental and food-producing plants and vegetables is provided by controlled oxidation of partially hydrolyzed proteinaceous materials. A correlation has been observed between activity and the formation of alpha-keto acids in the product. The composition has also been found to unexpectedly lend substantial freeze resistance to plants. It has been hypothesized that the composition acts as an initiator or "trigger" for plant metabolic reactions.

3,712,803
COMPOSITION AND METHOD FOR TREATING PLANTS AND TREES
Roland S. Grybek and Frederick B. Johnston, Tampa, Fla., assignors to Marketing and Research Services, Inc., Coral Gables, Fla.
No Drawing. Continuation-in-part of application Ser. No. 417,215, Dec. 9, 1964. This application June 4, 1969, Ser. No. 830,508
Int. Cl. A01n *9/02*
U.S. Cl. 71—79 **9 Claims**

A composition is provided which is effective to promote growth and impart freeze resistance to fruits,

vegetables, and ornamental plants and trees. The composition is provided by combining a proteinaceous material, such as trash fish, with a lignin sulfonic acid salt, such as calcium lignin sulfonate, subjecting the mixture to acid hydrolysis effective to solubilize substantially all the protein content, and treating the hydrolyzed mixture with oxygen with continuous agitation at a temperature of 20 to 80° C. for a period of from about 2 hours to two days. The resulting composition can be effectively applied to plants and trees as a foliar spray or an addition to the root zone soil, in amounts ranging from as little as about 0.01 gram per plant, on a dry weight basis, for smaller plants, up to as much as about 0.5 gram per tree, on a dry weight basis, for larger trees.

3,712,804

COMPOSITION FOR REGULATING THE GROWTH AND METABOLISM OF PLANTS

Walter Muller and Hubert Mayr, Leonding, near Linz (Danube), Ferdinand Weinrotter, Linz (Danube), Walter Frohner, Pasching, near Linz (Danube), and Elfriede Presoly and Gustav Kollisch, Linz (Danube) Austria, assignors to Osterreichische Stickstoffwerk Aktiengesellschaft, Linz (Danube), Austria

No Drawing. Filed June 17, 1969, Ser. No. 834,170
Int. Cl. A01n *9/24*
U.S. Cl. 71—113 **6 Claims**

A composition for regulating the growth and metabolism of plants, particularly for influencing their water balance, having as active ingredient a compound of the formula

$$C_nH_{2n+1}.X.COOH$$

in which n is an integer from 5 to 8 and X is a group of the formula

$$-\overset{\overset{O}{\|}}{C}-,\quad -\overset{\overset{OH}{|}}{CH}-,\quad -\overset{\overset{OH}{|}}{CH}-,\quad -\overset{\overset{OH}{|}}{C}.(COOH)-\text{ or }-\overset{\overset{NH_2}{|}}{C}.(COOH)-$$

the salts, lower alkyl esters, lower hydroxyalkyl esters, amides, monoalkylamides or dialkylamides thereof, and the process for the treatment of plants using the said compositions.

3,712,805

WEED CONTROL EMPLOYING N,N-DISUBSTITUTED AMINO ACID HERBICIDES

John Yates, Whistable, and David H. Payne, near Sittingbourne, England, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Original application Dec. 28, 1967, Ser. No. 694,116, now Patent No. 3,598,859, dated Aug. 10, 1971. Divided and this application Aug. 21, 1970, Ser. No. 66,094
Int. Cl. A01n *9/24*
U.S. Cl. 71—115 **10 Claims**

N,N-disubstituted amino acid derivatives such as N-benzoyl-N-(3,4-dichlorophenyl) alanine, herbicidal compositions containing them, and their use for controlling undesirable plant growth.

3,712,806

INCREASING THE SUGAR CONTENT OF CROPS WITH α-UREIDOOXYCARBOXYLIC ACID DERIVATIVES

Henry J. Gerjovich, deceased, late of Wilmington, Del., by Dorothy J. Gerjovich, executrix, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company

No Drawing. Continuation-in-part of application Ser. No. 801,170, Feb. 20, 1969, which is a continuation-in-part of application Ser. No. 657,040, July 31, 1967, both now abandoned, which in turn is a continuation-in-part of application Ser. No. 572,887, Aug. 7, 1966. This application Dec. 11, 1969, Ser. No. 884,362
Int. Cl. A01n *9/20*
U.S. Cl. 71—119 **7 Claims**

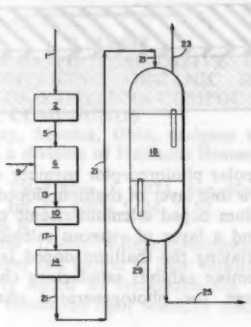
The sugar content of sorghum and sugar cane can be increased by applying to the crops an effective amount of an α-ureidooxycarboxamide such as α-(ureidooxy) propionamide during the period of 10 to 60 days prior to normally scheduled harvest.

3,712,807

REDUCTION OF HIGH PURITY ORES COATED WITH CARBONIZED CARBOHYDRATES

William Volk, Princeton, N.J., assignor to Hydrocarbon Research, Inc., New York, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,540
Int. Cl. C21b *1/00*
U.S. Cl. 75—1 **6 Claims**



High purity, fine, iron ore particles are first pretreated with a carbohydrate solution. The pretreated ore is then heated, before entering the reduction zone, to carbonize the carbohydrate material thereby leaving a coating of 0.25 to 1.0 percent carbon on the ore. This coating inhibits defluidization of the ore particles under the operating condition of the reduction zone.

3,712,808

DEEP HARDENING STEEL

Thoni V. Philip, Reading, Pa., assignor to Carpenter Technology Corporation, Reading, Pa.

No Drawing. Filed Nov. 26, 1971, Ser. No. 202,651
Int. Cl. C22c *39/54*
U.S. Cl. 75—125 **5 Claims**

A deep hardenable, low alloy steel having good temper resistance, hot hardness and dimensional stability consisting essentially of about 0.7–1.2% carbon, up to 0.6% manganese, 0.5–2.5% silicon, 0.5–1.5% chromium, 0.25–1.5% molybdenum, 0.15–0.5% nickel, 0.65–4% copper and the balance essentially iron except for incidental impurities, and in which $8.5\times\%Si+3\times\%Cu-5.2\leqq 10$.

3,712,809

METHOD OF MAKING CERMETS OF HIGH STATIC AND DYNAMICAL STRENGTH

Hellmut Bumm, Karlsruhe, Fritz Thümmler, Grunwettersbach, and Peter Weimar, Karlsruhe, Germany, assignors to Gesellschaft fur Kernforschung mbH, Karlsruhe, Germany

Filed Mar. 20, 1969, Ser. No. 808,955
Claims priority, application Germany, Mar. 23, 1968, P 17 71 026.8
Int. Cl. B22f *1/60*
U.S. Cl. 75—206 **12 Claims**

A method of fabricating cermets of high static and dynamic strength, including the steps of vibrating metal-coated ceramic particles having a particle size range between 20 and 500 μm. in metallic capsules, welding the capsules airtight, and compacting the particles to ultimate

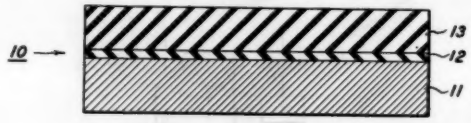
density by isostatic pressing at pressures between 100 and 1000 kg./cm.² and temperatures between 1000 and 1700° C., the capsules having still sufficient plasticity under the conditions of the compacting.

3,712,810

AMBIPOLAR PHOTORECEPTOR AND METHOD

Anthony J. Ciuffini, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1970, Ser. No. 99,558
Int. Cl. G03g 5/00, 7/00
U.S. Cl. 96—1.5 4 Claims



An ambipolar photoreceptor member which comprises a substrate, a thin layer of thallium doped vitreous selenium or thallium doped selenium-arsenic contained on the substrate, and a layer of vitreous selenium or selenium-arsenic overlaying the thallium doped layer. The photoreceptor member exhibits satisfactory charge acceptance and discharge for photogenerated charges of either polarity.

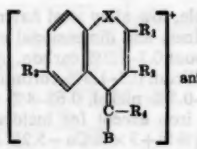
3,712,811

ELECTROPHOTOGRAPHIC MATERIAL

Yoshinobu Murakami, Osaka, Yo Hasegawa, Suita, and Kazuhisa Morimoto, Settsu, Japan, assignors to Matsushita Electric Industrial Company Limited, Osaka, Japan

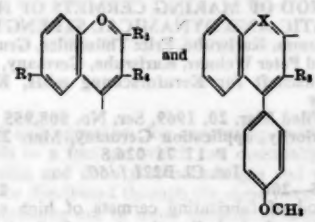
Filed Mar. 5, 1971, Ser. No. 121,508
Claims priority, application Japan, Mar. 13, 1970, 45/21,766, 45/21,767
Int. Cl. G03g 5/06
U.S. Cl. 96—1.6 3 Claims

An electrophotographic material is provided herein which comprises a conductive support layer and a photoconductive insulating layer, the latter layer comprising a photoconductive polymeric compound such as poly-N-vinylcarbazole, and a sensitizer having the following general formula



wherein

B represents a radical selected from the group consisting of



Compounds falling under the latter general formula include such compounds as 2-phenyl-4-[(2'-phenyl-4'-benzopyranylidene)benzyl]-benzopyrylium perchlorate and 2,3-phenyl - 4 - [(2'-phenyl-4'-benzopyranylidene)benzyl]-6-methylbenzopyrylium perchlorate.

3,712,812

PROCESS OF IMPROVING ADHERENCE OF HYDROPHILIC LAYER TO HYDROPHOBIC FILM SUPPORT

August Jean van Paesschen, Antwerp, Eric Maria Brinckman, Mortsel, and Wilfried Florent de Geest, Berchem, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

No Drawing. Continuation-in-part of abandoned application Ser. No. 883,242, Dec. 9, 1969. This application Apr. 19, 1972, Ser. No. 245,619
Claims priority, application Great Britain, Dec. 9, 1968, 58,350/68
Int. Cl. G03g 5/10; G03c 1/80
U.S. Cl. 96—1.8 9 Claims

In film recording materials, the adherence of a hydrophilic external layer such as a silver halide emulsion or a photoconductive layer to a hydrophobic film support is improved by first applying to the hydrophobic film support a layer of a copolymer formed of from 45–99.5% by weight of at least one chlorine-containing monomer of vinylidene chloride and vinyl chloride, from 0.5–10% by weight of an ethylenically unsaturated hydrophilic monomer, and from 0–54.5% by weight of at least one other copolymerizable ethylenically unsaturated monomer and then exposing the surface of the copolymer layer to a high voltage electric corona discharge. A preferred hydrophobic film support is a film of a highly polymeric linear polyester such as polyethylene terephthalate.

3,712,813

PRODUCTION OF SEMICONDUCTOR MODULES BY A PHOTO-RESIST TECHNIQUE WITH HOLOGRAPHIC PROJECTION OF ETCHING PATTERNS

Dieter Ross, Munich-Solln, and Horst Kiemle, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Dec. 15, 1970, Ser. No. 98,261
Claims priority, application Germany, Dec. 19, 1969, P 19 63 787.7
Int. Cl. G03c 5/04
U.S. Cl. 96—27 H 9 Claims

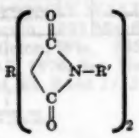
In the photo-resist technique of producing integrated circuits and other semiconductor modules, a plurality of holograms of respectively different etching patterns are sequentially projected onto a light-sensitive coating of a semiconductor substrate, another fabricating step being performed after photographic development of each etching pattern thus produced. At least three register marks are holographically projected together with each of the likewise holographically projected different etching patterns appertaining to one and the same module being produced. Relative to every one of the different etching patterns, the register marks have the same shape and the same position; and after the first exposing and etching these marks appear on the substrate surface as distinct reflective areas. During each subsequent exposing, the reflective register marks on the substrate are placed in registry with the spatial image of the register marks that, due to the reconstructed register-mark wave, appear when each of the other patterns is being produced. The accurate registering is done by adjusting to a maximal value the spacing of the fringe stripes of the interference field formed by the register-mark wave which is reflected from the register marks on the substrate on the one hand and by the comparison wave which simultaneously results from the hologram reproduction and which contains a virtual image of the register marks.

3,712,814
PHOTOGRAPHIC MATERIAL

Erwin Ranz, Harald von Rintelen, Heinz-Dieter Schutz, and Wolfram Neumann, Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 22, 1970, Ser. No. 100,815
Claims priority, application Germany, Jan. 8, 1970, P 20 00 623.9
Int. Cl. G03c 5/00
U.S. Cl. 96—36 4 Claims

Photographic layers containing a compound having the formula:

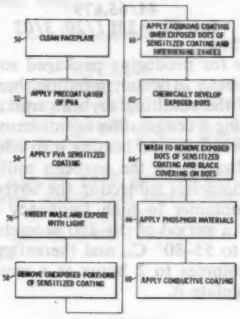


as explained below become less soluble or less swellable upon exposure at the light-struck areas. A relief image is obtained after removal of the unexposed areas.

3,712,815
METHOD OF MANUFACTURING A DISPLAY SCREEN

Kenneth L. Rohrer, Horseheads, N.Y., and Douglas A. Griswold, Blossburg, and David H. Davies, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1970, Ser. No. 51,144
Int. Cl. G03c 5/00
U.S. Cl. 96—36.1 7 Claims


CLEAN FACEPLATE
APPLY PRECOAT LAYER OF PVA
APPLY PVA SENSITIZED COATING
INSERT MASK AND EXPOSE WITH LIGHT
REMOVE UNEXPOSED PORTIONS OF SENSITIZED COATING
APPLY AQUADAG COATING OVER EXPOSED DOTS OF SENSITIZED COATING AND INTERVENING AREAS
CHEMICALLY DEVELOP EXPOSED DOTS
WASH TO REMOVE EXPOSED DOTS OF SENSITIZED COATING AND BLACK COVERING ON DOTS
APPLY PHOSPHOR MATERIALS
APPLY CONDUCTIVE COATING

An improved method of manufacturing a display screen for a cathode ray tube in which a light absorbing coating is provided on the display screen and surrounds the phosphor elements positioned on the display screen. This is accomplished by providing an array of polyvinyl alcohol (PVA) dots on the faceplate corresponding to the desired phosphor arrays, providing a coating of light absorbing material over the PVA dots and the intervening exposed surfaces of the faceplate, and then removing the PVA dots and the opaque coating covering the dots by chemically developing the PVA dots with a suitable oxidizing agent such as hydrogen peroxide and a chelating agent.

3,712,816
PROCESS FOR MAKING HARD SURFACE TRANSPARENT MASK

Eugene R. Blome, San Jose, and Samuel S. M. Fok, Palo Alto, Calif., assignors to Fairchild Camera and Instrument Corporation, Syosset, N.Y.

Original application Nov. 13, 1967, Ser. No. 682,458, now Patent No. 3,625,728, dated Dec. 7, 1971. Divided and this application Oct. 29, 1970, Ser. No. 85,006
Int. Cl. G03c 5/00
U.S. Cl. 96—38.3 3 Claims

A mask comprising a hard surface layer formed into a desired pattern is provided for use in photo fabrication. The layer is visually transparent but opaque to the range of wave lengths used to expose the photopolymer on the part being photo fabricated.

3,712,817
DRY WORKING PHOTOSENSITIVE COMPOSITIONS COMPRISING ORGANIC HALOGEN COMPOUNDS, ETHYLENE COMPOUNDS AND CARBINOL COMPOUNDS

Andrew C. Hazy, Mentor, Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,883
Int. Cl. G03c 5/24, 1/52
U.S. Cl. 96—48 R 8 Claims

The compound 1,1-bis-(4-dimethylaminophenyl)ethanol, its preparation and its use in light sensitive compositions particularly suited to reconnaissance film of dry processed, high resolution light sensitive material.

3,712,818
PHOTOGRAPHIC STABILISING OR FIXING BATH

Fritz Nittel and Hans Ohlschlager, Cologne-Stammheim, and Karl-Wilhelm Schranz, Opladen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

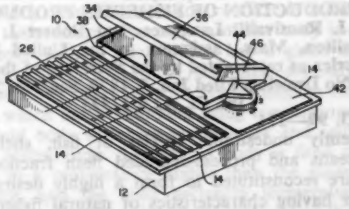
No Drawing. Filed June 25, 1969, Ser. No. 836,661
Claims priority, application Germany, June 27, 1968, P 17 72 734.3
Int. Cl. G03c 5/38
U.S. Cl. 96—61 1 Claim

In the production of photographic images by the exposure and development of silver halide emulsions the stabilisation or fixing of the exposed and developed emulsion by a bath containing a mercaptotriazine stabiliser.

3,712,819
VENTILATED OPEN-AIR INDOOR BROILER HAVING DAMPER MEANS AND CONTROL THEREFOR

Thomas R. Field, 4129 Flamingo W. Drive, Indianapolis, Ind. 46226

Filed Nov. 23, 1971, Ser. No. 201,436
Int. Cl. A47j 37/08
U.S. Cl. 99—400 17 Claims



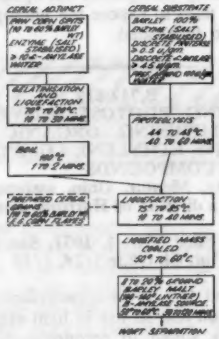
Ventilated open-air indoor broiler having damper means and positionable control therefor comprising an energizing switch for electric heating elements.

3,712,820

PROCESS FOR MAKING A BREWERS' WORT BEER

Martin F. Walmsley and John Valentine Cross, London, Ontario, Canada, assignors to John Labatt Limited, London, Ontario, Canada

Filed July 23, 1970, Ser. No. 57,762
Claims priority, application Great Britain, July 24, 1969, 37,312/69
Int. Cl. C12c 7/00
U.S. Cl. 99—51 9 Claims



This invention provides a process for producing a brewers' wort in which an aqueous slurry of a raw starch-containing material, preferably a cereal grain such as barley, is heated to 40°–55° C. at which temperature it is subjected to the action of a discrete proteolytic enzyme and, optionally, a discrete α-amylase enzyme, then heated to 65°–90° C. at which temperature it is subjected to the action of a discrete α-amylase enzyme to solubilise the starch, after which it is cooled to 400°–65° C. at which temperature it is subjected to the action of a discrete β-amylase enzyme or source thereof to produce fermentable sugars. Preferably, the protease enzyme is present in an amount of at least 0.5 modified Kunitz protease units per gm., the α-amylase enzyme in an amount of at least 45 modified Stein-Fischer α-amylase units per gm., and the β-amylase enzyme is malt present in an amount of less than 30% by weight. Advantageously, the mash bill includes up to about 60% by weight of a cereal adjunct, say, liquefied corn grits.

The invention also includes a process for the manufacture of beer or like non-distilled alcoholic beverages from such brewers' worts.

3,712,821

PRODUCTION OF FISHERIES PRODUCTS

Louis J. Ronsivalli, Lawrence, and Robert J. Learson, Hamilton, Mass., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Jan. 5, 1970, Ser. No. 798
Int. Cl. A23l 1/325
U.S. Cl. 99—111 9 Claims

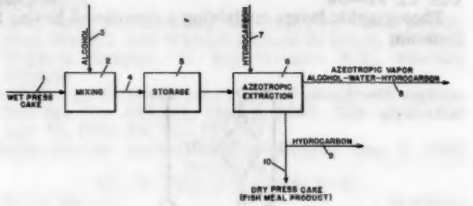
Presently undesirable species of fish, shellfish and crustaceans and process-degraded flesh fractions therefrom are reconstituted to form a highly desirable food product having characteristics of natural fisheries products. These reconstituted products will withstand heat sterilization, refrigerated storage and subsequent cooking without crumbling.

3,712,822

AZEOTROPIC REMOVAL OF WATER-HYDROCARBON ALCOHOL MIXTURES FROM PRESS FISH CAKE

Thomas L. Meade, 69 Kenyon Ave., Wakefield, R.I. 02879

Filed July 2, 1970, Ser. No. 52,042
Int. Cl. A23b 3/04; B01d 3/34
U.S. Cl. 99—209 26 Claims



A process for the preservation of wet fish press cake comprising the addition of an alcohol to the cake combined with the step of subsequently removing the alcohol and water by azeotropic extraction with a hydrocarbon. The process provides the advantages of allowing wet fish press cake to be stored for long periods of time, and when sufficient quantities have accumulated, the alcohol and water can be conveniently removed together to provide a dry fish meal product.

3,712,823

PROCESS FOR PRODUCING STERILIZED PACKED SOYBEAN-CURDS

Ryuzo Ueno, Nishinomiya, Japan, assignor to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Filed Aug. 17, 1970, Ser. No. 64,350
Claims priority, application Japan, Aug. 21, 1969, 44/65,679
Int. Cl. A23l 1/20, 3/02
U.S. Cl. 99—214 5 Claims

In a process for producing packaged soybean-curds by immersing soybean in water, grinding, heating and filtering it, cooling the resulting soybean milk, putting it in a container, adding a coagulating agent, immediately sealing the packing container, and heating it to effect the coagulation and sterilization of the soybean milk, the improvement which comprises subjecting the soybean milk packaged in the container to high frequency electrical wave irradiation for a period of 50–200 seconds until the temperature rises to 55–80° C., and thereafter allowing it to stand for 10 minutes to 2 hours at a temperature above 30° C. to coagulate it.

3,712,824

EASILY DISPERSIBLE PIGMENT AND PROCESS FOR PRODUCING SAME

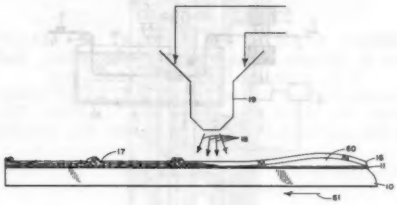
Yasumasa Kiyokawa, Yoshihisa O[illegible]wa, and Akira Ono, Osaka, Kazuichi Fukumasu, Nishinomiya, and Hiroyuki Sugisaki, Ashiya, Japan, assignors to Sakata Shokai Co., Ltd.

No Drawing. Filed Nov. 5, 1970, Ser. No. 87,299
Claims priority, application Japan, July 17, 1970, 45/6,262
Int. Cl. C08h 17/02
U.S. Cl. 106—308 M 8 Claims

An easily dispersible pigment is produced by admixing a water slurry of a pigment with an oil in water type emulsion which contains a varnish. The varnish comprises (1) an organic liquid which is difficultly water-miscible or water immiscible and which is characterized

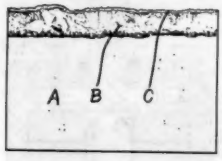
by a higher boiling point than water, (2) a resin which is compatible with said organic liquid, and (3) an organic solvent which is difficultly water soluble or water insoluble, but which is capable of dissolving or swelling the resin. The emulsion-slurry mixture is agitated whereby the pigment is transferred from the slurry into the oil phase. The mixture of the organic liquid, the resin and the pigment containing a number of foams is obtained and is dried to form an easily dispersible pigment.

3,712,825
METHOD OF MAKING SIMULATED MASONRY WALL
Tommy E. Yocum, 2102 Mayflower Drive, Middleton, Wis. 53562
Filed Dec. 7, 1970, Ser. No. 95,812
Int. Cl. B44d *1/52*
U.S. Cl. 117—8.5 **8 Claims**



Simulated masonry wall panels are provided by first coating a base panel with a base coat to simulate mortar and then spraying a finish-coat through a mask and then removing the mask. Panels to provide a simulated brick wall may abut with shiplap joints and each be three courses high and eight feet long.

3,712,826
METHOD OF IMPROVING THE SURFACE OF GALVANIZED STEEL MATERIAL
Tadao Kimuro and Takeshi Ataniya, Yokohama-shi, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 25, 1969, Ser. No. 819,251
Claims priority, application Japan, Apr. 25, 1968, 43/27,587
Int. Cl. B44d *1/08, 1/06*
U.S. Cl. 117—22 **5 Claims**



The present process for improving surfaces of galvanized steel materials, especially the properties of coated surfaces of strip, besides rendering the surfaces in condition for paint adhesion without detracting from the forming properties of galvanized steel materials.

3,712,827
RADIOGRAPHIC SCREEN
Eugene Patrick Gramza, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Oct. 21, 1969, Ser. No. 868,234
Int. Cl. B32b *27/08*; G03c *1/92*
U.S. Cl. 117—33.5 R **4 Claims**

Improved inorganic phosphor screens comprising a support bearing a layer comprising a binder of a polycarbonate polymer are described for radiographic use. Said screens exhibit improved image sharpness in combination with radiographic films.

3,712,828
APPLICATION OF ADHESIVE COATING TO ISOTACTIC POLYPROPYLENE AND COMPOSITION THEREFOR
Jean C. Bernard and Pierre J. Pascal, Martigues, France assignors to Naphtachimie, Paris, France
No Drawing. Filed June 25, 1970, Ser. No. 49,943
Claims priority, application France, July 1, 1969, 6922101
Int. Cl. B32b *27/32*; B44d *1/40*; C08f *15/04*
U.S. Cl. 117—47 A **8 Claims**

This invention is addressed to the application of an organic adhesive coating to plastic compositions containing isotactic polypropylene wherein articles formed of a polymeric composition selected from the group consisting of a mixture of from 75% to 97% by weight isotactic polypropylene and 3–25% of an olefin copolymer having low crystallinity and a graft copolymer formed of from 75% to 97% by weight isotactic polypropylene onto which is grafted 3–25% by weight of a copolymer of ethylene and propylene containing more than 10% by weight ethylene are coated with an adhesive material such as organic paints or adhesives.

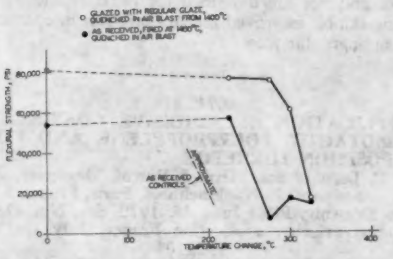
3,712,829
LUBRICIOUS, LABEL-ACCEPTING GLASS SURFACE COATING
Herman A. Steigelman, Toledo, Ohio, assignor to Owens-Illinois, Inc.
No Drawing. Filed Nov. 28, 1969, Ser. No. 880,967
Int. Cl. C03c *17/32*
U.S. Cl. 117—54 **5 Claims**

A mixture of polyvinyl alcohol and polyoxyethylene stearate is applied directly onto a glass surface to provide a label-accepting, lubricious coating therefor.

3,712,830
METHOD OF STRENGTHENING CERAMIC MATERIAL BY GLAZING AND QUENCHING
Henry P. Kirchner, 700 S. Sparks St., State College, Pa. 16801
Continuation-in-part of abandoned application Ser. No. 669,861, Sept. 22, 1967. This application Sept. 25, 1970, Ser. No. 75,329
Int. Cl. C03c *17/04*
U.S. Cl. 117—125 **19 Claims**

A method of increasing the strength of a ceramic body having a body thermal expansion coefficient and a body softening temperature. The surface of the body is coated at least once with a glaze which has a glaze thermal expansion coefficient and which has a glaze softening temperature which is lower than the body softening temperature, and which has a minimum firing temperature intermediate said body softening temperature and said glaze softening temperature. The coated body is fired at least one time to a temperature higher than the glaze firing temperature, and the body softening temperature and lower than the melting point of the material of the body. The glazed fired body is quenched in a quenching medium at an average surface cooling rate of at least 10° C./sec., and at a rate below that which will cause thermal

shock from the firing temperature to a temperature below the glaze softening temperature for first causing more rapid cooling of the exterior of the body than the interior for causing plastic flow in the interior of the body and producing positive compressive stresses in the exterior of the body, and then after passing the body softening temperature, for causing the glaze to be placed under a positive compressive stress resulting from the difference between the product of the body expansion coefficient and the temperature change of the body below the body softening temperature and the glaze expansion coefficient and the temperature change of the glaze below the glaze softening temperature. By this method the bending strength of the body is increased as compared with an unglazed and unfired body of the same ceramic.



3,712,831
CELLULOSIC FILMS WITH IMPROVED SLIP PROPERTIES

Jean Gattus, Villeurbanne, and Maurice Mallet, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

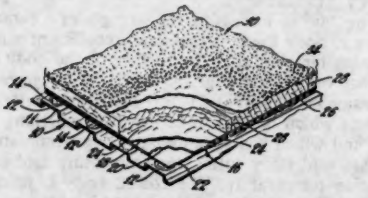
No Drawing. Filed Sept. 29, 1969, Ser. No. 862,005
Claims priority, application France, Oct. 1, 1968, 168,322
Int. Cl. B44d *5/08*
U.S. Cl. 117—144 **4 Claims**

Cellulosic films, especially of cellulose acetate, have their slip properties improved by incorporation, at least in the surface of the film, of 0.1–0.5% by weight of a mineral filler, e.g. silica or a metal oxide, which has been treated with an organopolysiloxane.

3,712,832
ROOF STRUCTURE

Stuart H. Stapleford, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Continuation of application Ser. No. 655,366, July 24, 1967. This application Aug. 20, 1970, Ser. No. 65,668
Int. Cl. C09j *5/06*
U.S. Cl. 156—321 **2 Claims**

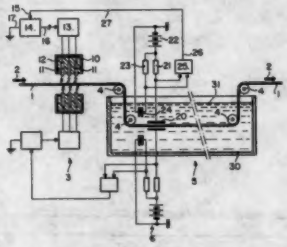


An insulated roof comprising a structural surface member with a vapor barrier adhered thereto, comprising asphalt sandwiched between two pieces of paper, and thermal insulation adhered to said vapor barrier over which is applied a waterproof covering. Also, a method of constructing a roof structure of the foregoing type by means of a cold adhesive with a fugitive solvent for adhering the vapor barrier to the structural member, and a hot bituminous adhesive over said vapor barrier for volatilizing the fugitive solvent.

3,712,833
PROCESS AND APPARATUS FOR DESCALING OXIDIZED SHEET METAL

Henri Fichaux, Thairy, France, assignor to Battelle Memorial Institute, Carouge/GE, Switzerland

Filed July 6, 1971, Ser. No. 159,628
Claims priority, application Switzerland, July 8, 1970, 10,326/70
Int. Cl. B08b *3/10;* **C23g** *1/00*
U.S. Cl. 134—1 **13 Claims**

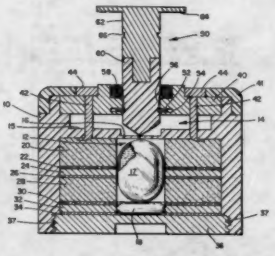


Sheet metal is submitted to an erosive sparking treatment preceding a conventional chemical descaling treatment. The sparking treatment may replace the conventional graining treatment. The apparatus includes a sparking device arranged upstream of a conventional chemical descaling bath and comprising a plurality of sparking elements distributed over the width of both faces of the sheet, and a generator for feeding these elements with current pulses producing electric arcs between them and the sheet-faces. It may also comprise a feedback control device for adjusting the frequency of the pulses in dependence on the obtained degree of descaling.

3,712,834
DEFERRED ACTION BATTERY

James B. Doe, Levittown, and Richard P. Niederberger, Pineville, Pa., and Michael C. Curcio and Michael H. Forker, Trenton, N.J. (all % ESB Incorporated, P.O. Box 8109, Philadelphia, Pa. 19101)

Filed Oct. 15, 1971, Ser. No. 189,513
Int. Cl. H01m *21/00*
U.S. Cl. 136—114 **4 Claims**



A deferred action battery is described having a cylindrical plastic container with metallic terminal contact pieces at either end. The battery plates are annular in shape and define a central cylindrical cavity. Within the

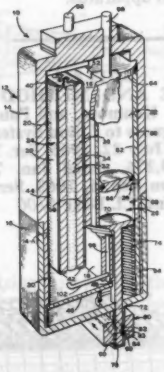
cavity are located a biscuit of dry pressed electrolyte, an ampoule containing a solution of potassium chromate, and a plunger. A portion of the plunger passes through the top of the battery container. The battery is activated by forcing the plunger into the ampoule causing it to break. The liquid within then dissolves the perchlorate to give the desired electrolyte which then permeates and activates the battery.

3,712,835

RESERVE CELL WITH MODULAR CONSTRUCTION

Gordon E. Kaye, Irvington, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Oct. 23, 1970, Ser. No. 83,370
Int. Cl. H01m *21/10*
U.S. Cl. 136—114 **8 Claims**



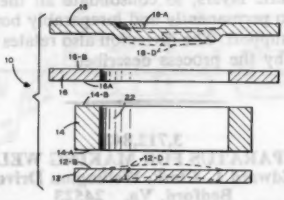
A reserve cell having a housing with two compartments separated by a central partition, with cell electrodes to be inserted into one compartment, and an electrolyte vial assembly into the second compartment, with associated means for fracturing the vial and forcing the electrolyte into the first mentioned compartment.

3,712,836

SOLID ELECTROLYTE CELL PACKAGING DEVICE

Per Bro and Charles C. Liang, Andover, and Gerard H. Boyle, West Concord, Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Nov. 18, 1970, Ser. No. 90,511
Int. Cl. H01m *1/00*
U.S. Cl. 136—166 **5 Claims**



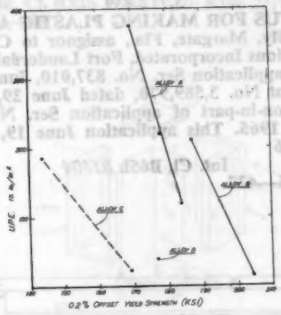
A hermetically sealed packaging container for a solid electrolyte cell, in which the container has two walls spaced and insulated from each other, and arranged to provide and serve as separate electrical contacts for the cell. The sealed container is evacuated, whereby the differential pressure between the evacuated atmosphere within the container and the normal pressure outside of the container will maintain good electrical contact between the two walls and the anode and the cathode materials.

3,712,837

PROCESS FOR OBTAINING COPPER ALLOYS

Stanley Shapiro, New Haven, Conn., Alan J. Goldman, Silver Spring, Md., and Derek E. Tyler, Cheshire, and Richard D. Lanam, Hamden, Conn., assignors to Olin Corporation

Filed Nov. 5, 1971, Ser. No. 196,006
Int. Cl. C22f *1/08*
U.S. Cl. 148—11.5 R **10 Claims**



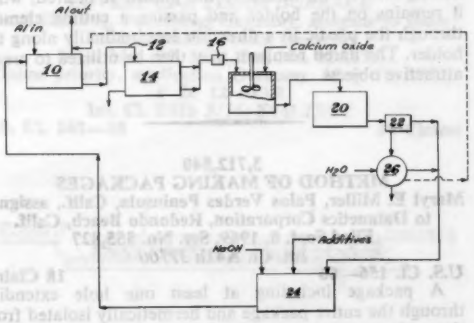
The disclosure teaches a method of preparing copper alloy having improved toughness and stress corrosion resistance. The process comprises: providing a copper alloy containing from 12.5 to 30% nickel, 12.5 to 30% manganese, balance copper; hot rolling said alloy with a starting temperature in the range of 780 to 900° C.; cold rolling said alloy; and annealing said alloy at a temperature of from 550 to 900° C. for at least one minute while maintaining an average grain size of less than 0.015 mm.

3,712,838

REGENERATION OF CAUSTIC LIQUOR FOR ETCHING ALUMINUM

Ulrich W. Weissenberg, Johannesburg, Transvaal, Republic of South Africa, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of abandoned application Ser. No. 591,538, Nov. 2, 1966. This application Mar. 17, 1971, Ser. No. 125,086
Int. Cl. C23g *1/36*
U.S. Cl. 156—19 **8 Claims**



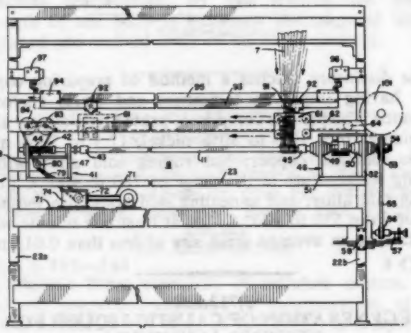
The present invention is a process for regenerating spent caustic etching solutions resulting from reacting aluminum with aqueous solutions containing free alkali metal

hydroxide. In particular a spent caustic etching liquor, ordinarily at the etching bath temperature, is contacted with calcium oxide to precipitate aluminum values present in the spent liquor and regenerate hydroxyl ions. The precipitate is removed from the regenerated solution.

ERRATUM

For Class 156—427 see:
Patent No. 3,712,832

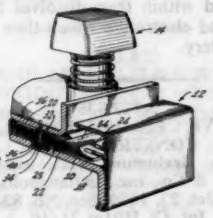
3,712,839
APPARATUS FOR MAKING PLASTIC ARTICLES
Uhel D. Polly, Margate, Fla., assignor to Consolidated Productions Incorporated, Fort Lauderdale, Fla.
Division of application Ser. No. 837,010, June 27, 1969, now Patent No. 3,589,970, dated June 29, 1971, and continuation-in-part of application Ser. No. 439,733, Mar. 15, 1965. This application June 19, 1970, Ser. No. 59,806
Int. Cl. B65h *81/04*
U.S. Cl. 156—427 **2 Claims**



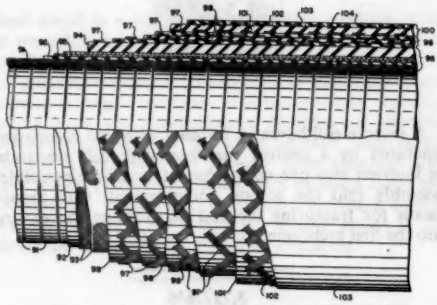
A method and apparatus for manufacturing plastic articles which consists of twisting a relatively flat strip of plastic so that it is helical in shape, winding the plastic in flattened layers on a holder, sealing the layers together while the twisted plastic remains on the holder, adding reinforcing means to the plastic, if desired, while it remains on the holder and passing a cutting element through the plastic in a direction longitudinally along the holder. The flared resultant may then be utilized to create attractive objects.

3,712,840
METHOD OF MAKING PACKAGES
Meryl E. Miller, Palos Verdes Peninsula, Calif., assignor to Datanetics Corporation, Redondo Beach, Calif.
Filed Sept. 8, 1969, Ser. No. 855,827
Int. Cl. A41h *37/00*
U.S. Cl. 156—66 **18 Claims**

A package including at least one hole extending through the entire package and hermetically isolated from the package contents, the package being formed by stacking a plurality of subassemblies between two face sheets of impervious material and aligning the contents by at least one vertical pin through which the hole passes. The package is bonded subsequent to stacking and is clamped together during bonding by a pair of pressure plates, the plates being removed upon completion of bonding to allow the final package to be positioned and aligned in an external apparatus.



3,712,841
FLEXIBLE HOSE AND METHOD OF MAKING
Clayton H. Skinner, Kenmore, and Paul J. Sick, Buffalo, N.Y., assignors to Litton Systems, Inc.
Original application July 22, 1965, Ser. No. 473,952, now Patent No. 3,420,276, dated Jan. 7, 1969. Divided and this application Feb. 6, 1968, Ser. No. 726,262
Int. Cl. B31c *5/00*
U.S. Cl. 156—144 **1 Claim**

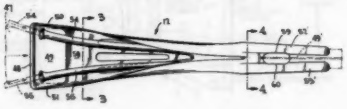


The invention relates to the process of making a flexible hose with a built-up body around a tubular metal bore support. The body of the hose made of elastomeric layers and intervening reinforcing layers, is built around the tubular metal bore support, which is flexibly and coherently constructed to serve as a mandrel, and the built-up assembly is then subjected to heat and pressure to cure the elastomeric layers, to consolidate all the layers into a unit and to permanently and inseparably bond the body to the bore support. The invention also relates to a flexible hose made by the process described.

3,712,842
APPARATUS FOR MAKING WELTS
Edward L. Clark, Wellington Drive, Bedford, Va. 24523
Original application Jan. 8, 1968, Ser. No. 696,339. Divided and this application June 28, 1971, Ser. No. 157,629
Int. Cl. B32b *3/04*
U.S. Cl. 156—464 **5 Claims**

A double or single welt for use in the upholstered furniture and other industries, as well as a method and an apparatus for making such welts. The double welt

comprises an elongated strip of textile or other material with its longitudinal edges folded or rolled inwardly toward each other to form two tubes, into which cords are preferably introduced, the outer surface of each infolded edge portion engaging the inner surface of the unfolded central portion of the strip and being permanently secured thereto as by adhesive, the cords being free to move longitudinally within the strip material. The single welt may be formed by slitting a double welt made as stated, or by forming a single fold or tube from a narrower strip



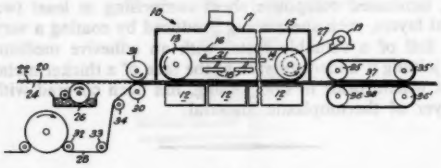
of material, utilizing essentially the same method of folding or rolling the material upon itself, inserting a cord if desired, and securing the outer surface of the folded material to the inner surface of the unfolded material. An apparatus suitable for performing the stated method comprises a folder mechanism, an adhesive applying means, and means for advancing the material (and cords if used) through said mechanism and past said adhesive applying means.

3,712,843

METHOD AND APPARATUS FOR PRODUCING CORRUGATED BOARD

Phoebus A. Gartaganis, Beaconsfield, and Denis Michael Harvey, Baie d'Urfe, Quebec, Canada, assignors to Domtar Limited, Montreal, Quebec, Canada

Filed Dec. 7, 1970, Ser. No. 95,599
Int. Cl. B30b *15/34*; B32b *31/20*
U.S. Cl. 156—499 **4 Claims**



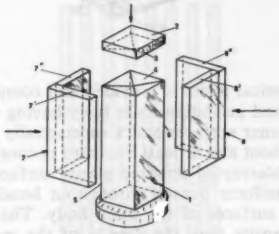
In this method of making corrugated board the board formed by the application of the liner to the single-face is passed between two metal surfaces, both heated to a suitable temperature. The temperature of the metal surface in contact with the liner is about the same as, or preferably somewhat higher than, the temperature of the other metal surface. In a corresponding apparatus the surface applying heat to the single-face is constituted by an endless moving metal belt, e.g. made of fatigue-resistant rolled spring steel.

3,712,844

SEALING OF FOAM PLASTIC SHEETS

Antonius G. Ratten, Jan H. van Brederode, Delft, Netherlands, assignors to Stichting Ontwikkeling Verpakkingsmethoden In de Zuivelindustrie, The Hague, Netherlands

Filed June 15, 1970, Ser. No. 46,431
Claims priority, application Netherlands, June 18, 1969, 6909334
Int. Cl. B32b *3/04, 7/10*; B29c *27/00*
U.S. Cl. 161—38 **22 Claims**



The invention relates to a method for overlapping sealing foam plastic films or foam plastic sheets with a density below 250 kg. per m.^{3}, which are laid on top of each other without a bonding agent and are compressed in dies at a temperature above the softening point of the plastic. Thereafter the pressure is reduced, so that the compressed product foams rapidly again to form a new integral sheet of a predetermined foam plastic thickness, at which time it is cooled to reform the product for example, a single blank folded into a container having a bottom consisting of flaps folded into each other, and a side seam can all be sealed and reformed into an integrated whole with a final thickness substantially equal to the thickness of one single sheet.

3,712,845

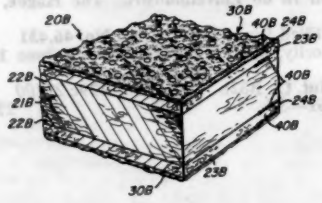
TILE FLOOR COVERING AND METHOD OF COVERING A FLOOR SURFACE

Josef Hartung, Petersberg, Germany, assignor to Dura Tufting GmbH, Fulda, Germany

Filed Mar. 15, 1971, Ser. No. 124,171
Claims priority, application Germany, Mar. 17, 1970, P 20 12 523.9
Int. Cl. B32b *3/16*; E04f *15/02*
U.S. Cl. 161—38 **10 Claims**

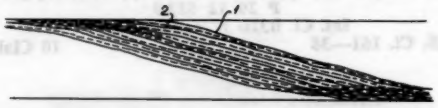
Textile tiles are coated on their undersides with filled polypropylene and are then placed, next to one another, on a layer of stabilized polyester, polyethylene or polyvinyl chloride.

3,712,846
ACOUSTICAL PANEL
William M. Daniels, Hackettstown, and Richard A. Borton, Mountain Lakes, N.J., assignors to L. E. Carpenter & Company, Wharton, N.J.
Filed June 23, 1971, Ser. No. 155,954
Int. Cl. C04b *43/02*; E04b *1/74*
U.S. Cl. 161—43 **16 Claims**



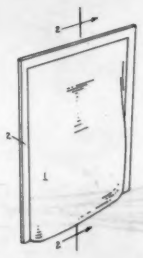
An acoustical panel is provided and comprises a sound absorbing and insulating main body having uninterrupted opposed planar surfaces and a substantially uniform density throughout and at least one hard porous member also having uninterrupted opposed planar surfaces and a substantially uniform density throughout bonded to one of the planar surfaces of the main body. The member has a higher density than the density of the main body and a thickness which is less than the thickness of such main body with the member being air pervious and allowing sound waves to be transmitted therethrough. The panel also has a flexible outer covering having a plurality of openings therethrough which is bonded to the exposed planar surface of the member with the covering having a thickness which is less than the thickness of the member and a roughened outside surface defined by projections and indentations which serve as miniature sound baffles.

3,712,847
LAMINATED LAMELLAR LAMINATE
Ole-Bendt Rasmussen, 7 Topstykket, 3460 Birkerod, Denmark
Original application Dec. 29, 1967, Ser. No. 694,660, now Patent No. 3,547,761, dated Dec. 15, 1970. Divided and this application Sept. 28, 1970, Ser. No. 76,196
Claims priority, application Great Britain, Dec. 30, 1966, 58,429/66
The portion of the term of the patent subsequent to Dec. 15, 1987, has been disclaimed
Int. Cl. B32b *5/22, 5/24*
U.S. Cl. 161—55 **2 Claims**



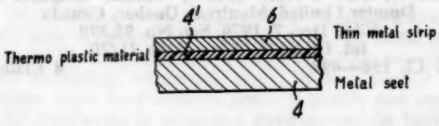
A laminate comprising at least two sheets of which at least one is an extruded sheet in which at least two different polymeric materials form alternate reinforcement and filling lamellar layers extending from surface to surface of the sheet at a so small inclination (below 2°) as to form a (directly extruded) quasi-laminate, the reinforcement layers of which are of a thinness approaching colloidal dimensions, the adjacent sheets of said laminate having different direction of molecular orientation.

3,712,848
DEOXYGENATED PACKAGE
William P. Casey, Jr., and Frank G. Grundman, Neenah, Wis., assignors to American Can Company, New York, N.Y.
Continuation of application Ser. No. 343,622, Feb. 6, 1964. This application Sept. 4, 1969, Ser. No. 856,899
Int. Cl. B32b *15/08*; B65b *65/00*
U.S. Cl. 161—213 **1 Claim**



A laminar sheet material including a gas and water impermeable layer, a gas permeable and water impermeable layer and a bonding material therebetween containing a catalyst capable of initiating reaction between hydrogen and oxygen to form water. In a sealed pouch formed of the sheet, oxygen is removed by formation of water which is trapped between the two layers and thus out of contact with the packaged product.

3,712,849
METALLIC LAMINATE
Dante Robbiati, Via Dante 6, Bernareggio, Italy
Application Dec. 12, 1968, Ser. No. 783,198, which is a continuation-in-part of abandoned application Ser. No. 446,186, Apr. 7, 1965. Divided and this application July 6, 1971, Ser. No. 160,051
Claims priority, application Italy, Dec. 14, 1964, 54,372/64
Int. Cl. B32b *15/08, 15/18, 15/20*
U.S. Cl. 161—218 **1 Claim**

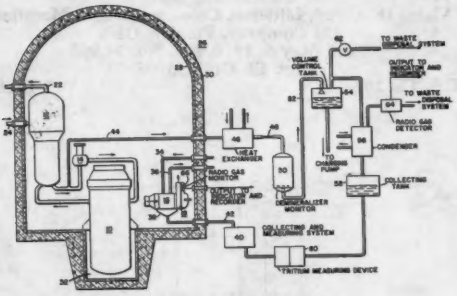


A laminated composite sheet comprising at least two metal layers, such sheet being produced by coating a very thin foil of a valuable metal with an adhesive medium and joining it under pressure to the face of a thicker metal sheet which, prior to said joining, has been covered with a layer of thermoplastic material.

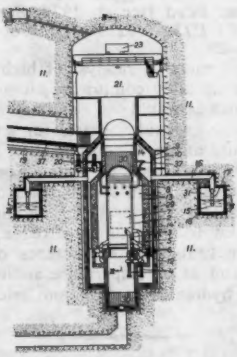
3,712,850
METHOD FOR DETERMINING REACTOR COOLANT SYSTEM LEAKAGE
Donald A. Campbell and John Locante, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Aug. 8, 1969, Ser. No. 848,675
Int. Cl. G21c *17/02*
U.S. Cl. 176—19 R **11 Claims**

The invention provides indirect and direct methods for determining leakage from a reactor coolant system

inside the reactor containment. The indirect method relies on the comparison of quantitative measurements of a tracer, such as tritium, in the reactor coolant to the tracer in the condensate collected by the containment cooling coils to determine what part of the total collection, representing all leakage, is derived from the reactor coolant system. The direct method relies on measurements of radioactivity produced by short half-lived noble gas isotopes. Measurements at a volume control tank, which is part of the reactor coolant system, and in the containment atmosphere provide sufficient information to directly reduce the reactor coolant system leakage rate.

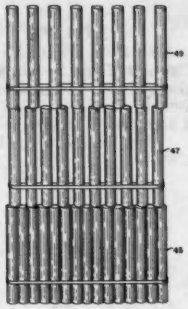


3,712,851
NUCLEAR POWER STATION
Per Gustaf Isberg, Christen Willemoes Pind, and Cnut Herbert Sundqvist, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Mar. 27, 1969, Ser. No. 811,123
Claims priority, application Sweden, Mar. 28, 1968, 4,118/68
Int. Cl. G21c *9/00*
U.S. Cl. 176—37 **24 Claims**



A nuclear power station for location in heavily populated areas has a nuclear reactor which is surrounded by a conventional containment vessel. The containment vessel is located in a rock cavern forming a secondary containment and is supported from beneath and laterally by the floor and the walls of the rock cavern. The rock cavern is reinforced and made tight by injection of grout and a third containment is formed by the surrounding ground water which may be provided artificially. A pressure transmitting, missile protecting and non-leaktight shield is provided between the reactor and the primary containment so that the reactor is indirectly supported by the rock chamber walls.

3,712,852
NUCLEAR REACTOR CONTROL ROD
John R. Fisher, 13019 Margot Drive, Rockville, Md. 20853
Continuation of abandoned application Ser. No. 577,066, Sept. 2, 1966. This application July 8, 1968, Ser. No. 752,111
Int. Cl. G21c *7/10*
U.S. Cl. 176—86 **2 Claims**



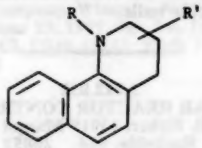
A control rod (movable or fixed) for a water moderated nuclear reactor is comprised of a plurality of tubular, rectangular, or oval members which are coplanar and in parallel thus forming a blade or slab. The members are of a neutron absorbing material such as boron carbide, hafnium, silver-indium-cadmium, etc., and are spaced such that a neutron moderator as water or D_2O can flow between the members, or a solid moderator such as zirconium hydride can be placed between the members. The spacing between members can be varied axially, can be varied from one end of the blade to the other, or both. In this manner the neutron absorption rate can be shaped along the blade. Said blades may form a cruciform, Y shape, or slab and may be the movable type which can be positioned by a drive or the fixed type which can only be positioned or removed manually.

Also, a control rod for a water moderated nuclear reactor is comprised of a solid blade of neutron absorber, such as hafnium, having cruciform, Y, slab shape, etc., either movable or fixed, with a series of bore holes which allow moderator to flow through the rod and thus providing neutron moderation within the rod.

3,712,853
DIAGNOSTIC AGENT FOR THE DETECTION OF NITRITE AND OF NITRITE-FORMING BACTERIA
Walter Rittersdorf, Hans-Georg Ray, and Peter Rieckmann, Mannheim-Waldhof, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany
No Drawing. Filed July 15, 1970, Ser. No. 55,246
Claims priority, application Germany, Aug. 14, 1969, P 19 41 370.8
Int. Cl. C12k *1/04*
U.S. Cl. 195—103.5 R **18 Claims**

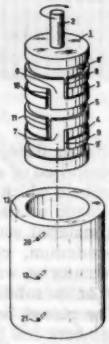
Nitrites, e.g., nitrites formed by bacteria in body fluids, are detected even in very small concentrations, with a

diagnostic test reagent comprising a diazotizable amine, a solid organic acid, and a coupling component of the formula



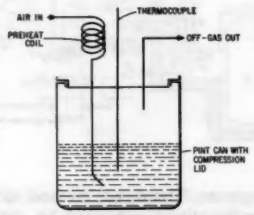
wherein R is hydrogen or alkyl, preferably lower alkyl, and R' is hydrogen, hydroxyl or alkyl, preferably lower alkyl, or acyloxy, preferably lower acyloxy.

3,712,854
EXPANSIBLE DRILLING TOOL
Theodore G. Thometz, Long Beach, and Paul J. Arnerich, Fountain Valley, Calif., assignors to The Servco Company, Long Beach, Calif.
Filed Jan. 18, 1971, Ser. No. 107,273
Int. Cl. E21b *43/16*
U.S. Cl. 175—269 **13 Claims**



A tandem hole opener or drilling tool for underground holes is described. The lower portion of the tool is conventional. The upper portion of the tandem drilling tool has cutters mounted on a pair of cutter arms that are pivotally mounted on a pair of dovetail members fitting into a dovetail groove in the tool body. Pipe plugs between the dovetail members wedge them into frictional engagement with the slot. An axially slidable piston has a camming end for riding along a camming ramp on each cutter arm for camming them into an extended cutting position. A bearing surface on the piston engages a bearing surface on each arm for holding them in the extended position. The piston has an axial passage with an orifice of selected diameter through which drilling fluid can flow to the cutters. A parallel passage through the tool body permits drilling fluid to be apportioned between the upper cutters and cutters on the lower portion of the tandem drilling tool. Drilling fluid pressure also strokes the piston downwardly for camming the arms into cutting position. If the piston should fail to retract when drilling fluid pressure is relieved, drawing the tool upwardly against an object of lesser diameter than the extended arms presses downwardly on the arms, thereby sliding the dovetail members in the dovetail slot and disengaging the bearing surfaces between the arms and piston so that the arms cam the piston into a retracted position.

3,712,855
CONTROL OF CALCINED PETROLEUM COKE PARTICLE SIZE
Victor D. Allred, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
Filed May 6, 1970, Ser. No. 34,965
Int. Cl. C10b *53/08*
U.S. Cl. 201—6 **7 Claims**



The particle size of calcined petroleum coke product can be controlled by either (1) contacting coke with 2–21 mole percent oxygen atmosphere at about 450–600° F. for ½–16 hours to prevent an increase in particle size during later calcining, or (2) high volatile petroleum coke fines can be consolidated by calcining them at from about 1800 to about 3000° F. for about ½ to about 2 hours under an atmosphere substantially free from oxygen.

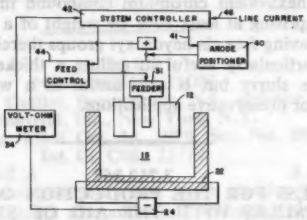
3,712,856
METALLIC CATALYST AND ALUMINUM OXIDE CONTAINING SUPPORTS FROM ACID LEACHED ALLOYS
Erwin C. Betz, 524 Mill Valley Road, Palatine, Ill. 60067
No Drawing. Filed Dec. 2, 1970, Ser. No. 94,627
Int. Cl. C23b *5/02*; B01j *11/08, 11/06*
U.S. Cl. 204—29 **50 Claims**

An improved metallic catalyst of high surface area is prepared from an alloy comprising aluminum and a second metal which is soluble in oxidizing acids. This alloy is contacted with an oxidizing acid for a time period and at a temperature and acid concentration sufficient to dissolve a portion of the second metal. The alloy is subsequently contacted with an alkali metal hydroxide under conditions sufficient to convert the aluminum at the surface of the alloy to aluminum hydroxide. The alloy thus treated is then heated in the presence of oxygen for a time period and at a temperature sufficient to convert the aluminum hydroxide to aluminum oxide.

3,712,857
METHOD FOR CONTROLLING A REDUCTION CELL
Richard G. Piller, Gresham, Oreg., assignor to Reynolds Metals Company, Richmond, Va.
Filed May 20, 1968, Ser. No. 730,408
Int. Cl. C22d *3/12, 3/02*; B01k *3/00*
U.S. Cl. 204—67 **14 Claims**

A method of objectively controlling an electrolytic cell wherein alumina is fed into the cell's bath in response to the detection of a predetermined change of the cell's

resistance; but wherein feeding is prevented for a given dwell period after each feed cycle even though subsequent feeding conditions otherwise exist during the dwell period.



3,712,858
PRODUCTION OF SODIUM

Francis Joseph Ross, Niagara Falls, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

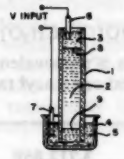
No Drawing. Filed Aug. 3, 1971, Ser. No. 168,766
Int. Cl. C22d *3/06*
U.S. Cl. 204—68 11 Claims

Quaternary salt compositions and their use in the electrolytic production of sodium are provided. These compositions consist essentially of about 30–60 percent barium chloride, about 4–35 percent calcium chloride, about 2–25 percent potassium chloride, and about 14–52 percent sodium chloride, with the total of these four components equaling 100 percent and having a first arrest point under 620° C., preferably under 585° C. Use of preferred compositions as cell baths in a sodium cell permits the efficient production of sodium with such a reduced calcium content as to minimize or even eliminate cell tickling operations and minimize final purification and sludge recovery.

3,712,859
PROCESS FOR PARTICLE SEPARATION

Robert H. Dilworth III, Knoxville, Tenn., assignor to Ortec, Incorporated, Oak Ridge, Tenn.

Original application June 13, 1968, Ser. No. 736,642, now Patent No. 3,630,882, dated Dec. 28, 1971. Divided and this application Sept. 27, 1971, Ser. No. 184,091
Int. Cl. B01k *5/00*
U.S. Cl. 204—180 G 7 Claims

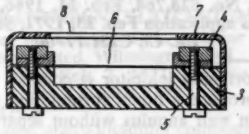


A mixture of particles in a suspending medium is subjected to an intermittent DC electric field of strength which is sufficient to produce a sharp separation of two or more components of the mixture. The duty cycle of the field is such that electric power dissipation in the mixture produced by the intermittent DC electric field does not materially cause loss of sharpness of separation of the components, and the application of the intermittent DC electric field is regulated in such a way as to produce a selected low average DC power dissipation in the mixture and which may be substantially constant in spite of variations in the impedance of the mixture throughout the period of the separation.

3,712,860
HYGROSENSITIVE ELEMENT

Pavel Stepanovich Gabrusenok, Sadovaya ul. 24, kv. 12, Leningrad, U.S.S.R.

Filed Nov. 19, 1968, Ser. No. 776,969
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 W 3 Claims



A hygrosensitive element with a coating applied to a base and consisting of a hygroscopic salt and a binding agent and a method of its manufacture according to which a flexible electric insulating film is pulled uniformly and continuously through a solution of gelatin for producing a uniform layer of gelatin on said film said layer being subsequently impregnated with an aqueous solution of a hygroscopic salt with tanning components so that the salt would be distributed uniformly over the layer of gelatin, the film coating is then dried, exposed to light for tanning the gelatin and the strip is cut into separate film elements.

3,712,861
UPGRADING A HYDROCARBON UTILIZING A CATALYST OF METAL SULFIDES DISPERSED IN ALUMINA

Edward J. Rosinski, Deptford, and Fritz A. Smith, Haddonfield, N.J., assignors to Mobil Oil Corporation

No Drawing. Continuation-in-part of application Ser. No. 20,028, Mar. 16, 1970. This application Oct. 19, 1970, Ser. No. 82,185
Int. Cl. C10g *23/02, 23/04*
U.S. Cl. 208—216 3 Claims

Upgrading of hydrocarbons containing sulfur and metal contaminants is effected with a catalyst containing 0.5–20 wt. percent metal sulfides dispersed in an alumina. The metal sulfides may include one or more metals of Groups VI and VIII, such as molybdenum sulfide. The catalyst is characterized with an average pore diameter of about 278 angstroms and a surface area of about 60–65 $m.^2/gm.$

3,712,862
WELL TREATING FLUID AND METHODS

Charles O. Bundrant, Charles R. Hainebach, and Frank H. Mayo, Houston, Tex., assignors to Champion Chemicals Inc., Houston, Tex.

Continuation of abandoned application Ser. No. 814,496, Mar. 17, 1969, which is a continuation-in-part of abandoned application Ser. No. 635,180, May 1, 1967. This application Oct. 16, 1970, Ser. No. 81,525
Claims priority, application Canada, Feb. 13, 1967, 982,743
Int. Cl. C23f *11/00, 11/10*
U.S. Cl. 252—8.55 E 10 Claims

A weighted liquid corrosion inhibiting formulation for use in oil wells containing a water insoluble organic iron corrosion inhibitor, an aqueous solution of a water soluble weighting agent and a coupling agent such as a lower alcohol. The soluble weighting agent may be, for example, an ammonium salt, phosphoric acid, a polyol, sugar, or certain organic acids.

3,712,863
WELL TREATING FLUID AND CORROSION INHIBITOR

Charles O. Bundrant, Houston, Tex., and Charles R. Hainebach, Lafayette, La., assignors to Champion Chemicals, Inc., Houston, Tex.

No Drawing. Division of application Ser. No. 88,168, Nov. 9, 1970, which is a continuation of application Ser. No. 770,130, Oct. 23, 1968, which is a continuation-in-part of application Ser. No. 634,967, May 1, 1967, which in turn is a continuation-in-part of application Ser. No. 528,764, Feb. 21, 1966, all now abandoned. This application Feb. 23, 1971, Ser. No. 118,171
Int. Cl. C23f *11/00*
U.S. Cl. 252—8.55 E 6 Claims

An iron corrosion inhibitor is coupled to a weighting material to produce a liquid formulation which will fall through oil in well annulus without separation but after it has fallen through water beneath the oil the inhibitor will separate from the weighting material and float back to the oil-water interface where it can enter well tubing ports. The inhibitor includes carboxlyic acid, e.g. petroleum wax oxidate, type inhibitor reacted with amine type corrosion inhibitor and dispersed in an organic solvent system. Sulfonic acid may be used to disperse the water insoluble amines. The weighting material is water soluble metal salt including zinc chloride. Usually an alcohol is the coupling agent.

3,712,864
SYNTHETIC HYDROCARBON BASED GREASE COMPOSITIONS

Donald E. Loeffler, Ferguson, Mo., George D. Hussey, East Alton, Ill., and George Smith, Pinole, and Johannes M. Wortel, Walnut Creek, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed June 17, 1970, Ser. No. 47,125
Int. Cl. C10m *7/02, 7/14*
U.S. Cl. 252—28 5 Claims

Hydrogenated high-naphthenic content oligomerized alpha-olefin lubricating oil thickened to grease consistency with clays and other conventional grease thickeners.

3,712,865
EDIBLE OIL EMULSIONS

Mervyn Thomas Arthur Evans, Ayot St. Lawrence, and Laurence Ian Irons and John Richard Mitchell, St. Albans, England, assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Dec. 30, 1969, Ser. No. 889,289
Claims priority, application Great Britain, Dec. 31, 1968, 61,976/68
Int. Cl. B01j *13/00*
U.S. Cl. 252—312 11 Claims

The emulsifying properties of protein used in food emulsions such as ice cream are improved by acylation, the acyl group being that of an aliphatic monocarboxylic acid of from 4 to 10 carbon atoms. The degree of acylation may be as much as 80% or even more, and is readily effected by acylation in aqueous solution with the corresponding anhydride by pH control. The heat-coagulable N-acylated proteins are novel.

3,712,866
METHOD OF GELLING WATER BEARING COMPOSITIONS CONTAINING THICKENERS

Errol Linton Falconer, Mont-Saint-Hilaire, Quebec, Canada, assignor to Canadian Industries Limited, Montreal, Quebec, Canada

No Drawing. Filed Mar. 26, 1970, Ser. No. 23,081
Claims priority, application Canada, Apr. 23, 1969, 49,569
Int. Cl. B01j *13/00*
U.S. Cl. 252—316 7 Claims

A method is provided for the very rapid gelling of cis-hydroxylated polymers, such as galactomannans, in an aqueous medium by adding thereto a selected crosslinking agent consisting of the product obtained by the admixture of a soluble trivalent antimony compound and a soluble hexavalent chromium compound in a polar liquid comprising at least 10% by weight of a glycolic substance having free cis-heydroxyl groups therein. The method is particularly useful in gelling a thickened aqueous explosive slurry but is also useful in a wide range of coating or preservative applications.

3,712,867
PROCESS FOR THE PRODUCTION OF MICROCAPSULES WITH THE AID OF SYNTHETIC COACERVATES AND MICROCAPSULES PRODUCED THEREBY

Nikolaus Schon, Leverkusen, Hildegard Schnoring, Wuppertal-Elberfeld, Josef Witte, Cologne-Stammheim, and Gottfried Pampus, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 17, 1971, Ser. No. 116,253
Claims priority, application Germany, Mar. 4, 1970, P 20 10 110.4
Int. Cl. B01j *13/02;* B44d *1/02*
U.S. Cl. 252—316 8 Claims

A process for the production of microcapsules with coacervates of synthetic polymers as shell substance, wherein the solid or liquid core material to be encapsulated is dispersed in an aqueous solution of a thermoreversible coacervating copolymer of 70 to 30 mol percent of the acrylic acid and 30 to 70 mol percent of acrylamide at a temperature above the coacervate transition temperature, the resulting dispersion is cooled to below the coacervate transition temperature, the coacervate formed is deposited onto the dispersed particles, is optionally chemically crosslinked, and the microcapsules obtained are separated off and dried.

3,712,868
FOAM CONTROL PROCESS

Frederick C. Saunders, Cowbridge, Wales; Kelvin J. Bryon, Upper Basildon, England; and Brian J. Griffiths, Pontycymmer, Wales (all % Midland Silicones Limited, Reading, England)

No Drawing. Filed May 25, 1970, Ser. No. 40,440
Int. Cl. B01d *17/00*
U.S. Cl. 252—321 7 Claims

Foaming in aqueous media, for example fermentation broths, is suppressed or reduced by contacting the aqueous medium with an organosilicon polymer having at least two organosiloxane units in which at least one of the organic substituents is a polyoxyethylene group of the general formula

$$RO[CH_2CH_2O]_y—$$

wherein R represents a monovalent hydrocarbon radical, a triorganosilyl radical or an acyl radical and y has a value of 2, 3 or 4.

3,712,869
PROCESS OF DECOMPOSITION OF 1,1,1,2-TETRACHLOROETHANE

Correia Yves, Saint-Auban, and Clair Rene, Savigny, Seine, Orge, France, assignors to Produits Chimiques Pechiney-Saint Gobain, Neuilly-sur-Seine, France

No Drawing. Filed June 9, 1970, Ser. No. 44,859
Claims priority, application France, June 18, 1969, 6920313
Int. Cl. B01j *1/16*
U.S. Cl. 252—407 5 Claims

This invention is addressed to a new and improved method for inhibiting the decomposition of 1,1,1,2-tetrachloroethane and an inhibited composition formed thereby wherein an inhibitor consisting essentially of an aliphatic aldehyde, an aromatic aldehyde, chlorinated derivatives of the foregoing aldehydes which are soluble

in 1,1,1,2-tetrachloroethane with other chlorinated solvents, or cyclic trimers of aliphatic aldehydes and mixtures thereof are added to a solvent composition containing 1,1,1,2-tetrachloroethane.

3,712,870
POLYMERIZATION
David G. Guillot, Pequannock, N.J., assignor to Uniroyal, Inc., New York, N.Y.
No Drawing. Filed Oct. 14, 1970, Ser. No. 80,799
Int. Cl. C08g *23/14*
U.S. Cl. 260—2 A **5 Claims**

A catalytic composition which is the reaction product of an organometallic compound and an aminopolyol, the polymerization of an epoxide compound with such catalytic composition, and the epoxide polymer obtained therefrom.

3,712,871
PHOTOPOLYMERIZABLE COMPOSITIONS USEFUL AS A PRINTING INK VEHICLE
George Pasternack, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
No Drawing. Filed Feb. 18, 1971, Ser. No. 116,626
Int. Cl. C09d *3/64, 5/32, 11/02*
U.S. Cl. 260—22 XA **11 Claims**

A photopolymerizable composition comprised of a mixture of (1) the resinous condensation product of (a) an acid modified drying oil prepared from an ethylenically unsaturated dicarboxylic acid and a drying oil (b) the dihydroxyalkyl ether of a bisphenol (2) a polymerizable unsaturated polyester prepared from a polyhydric alcohol and an alpha, beta-ethylenically unsaturated monocarboxylic acid and (3) a chlorinated polyphenyl.

The photopolymerizable compositions are useful in the preparation of vehicles for printing inks which when printed on a substrate dry rapidly to a non-offsetting condition under irradiation with ultraviolet light.

3,712,872
COMPOSITION COMPRISING ACRYLONITRILE-BUTADIENE-STYRENE POLYMER BEADS COATED WITH NN' ETHYLENE BIS STEARAMIDE
Sidney G. Lammers, Liverpool, N.Y., and Anthony N. Ciarlone, Clark, and Frederick E. Carrock, Paramus, N.J., assignors to Rexall Drug and Chemical Company, Los Angeles, Calif.
Filed Jan. 3, 1969, Ser. No. 788,805
Int. Cl. B28b *1/02*; B29c *5/04*; C08f *21/04*
U.S. Cl. 260—23.7 N **3 Claims**

A composition including acrylonitrile-butadiene-styrene polymer particles preferably in bead form coated with 0.25% to 2.00% by weight of either NN' ethylene bis stearamide or calcium stearate. The particle size of the beads is preferably smaller than 600 microns. The composition is useful in rotationally casting articles from acrylonitrile-butadiene-styrene polymers.

3,712,873
TEXTILE TREATING COMPOSITIONS WHICH AID IN THE REMOVAL OF SOIL FROM POLYESTER AND POLYAMIDE SYNTHETIC TEXTILE MATERIALS
William Edward Zenk, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Continuation-in-part of application Ser. No. 763,950, Sept. 30, 1968. This application Oct. 27, 1970, Ser. No. 84,482
Int. Cl. D06m *15/00, 3/30, 5/00*
U.S. Cl. 260—29.2 E **8 Claims**

Textile treating compositions comprising fatty alcohol polyethoxylates; quaternary ammonium compounds containing a single, long alkyl chain; a copolymer of a dibasic carboxylic acid and glycolic compounds; and either starch, carboxymethylcellulose, modified starch, polyethylene glycol, or copolymers of maleic anhydride and either methyl-vinyl-ether or ethylene; the process of treating synthetic textiles containing polyester or polyamide synthetic textile materials with the above compositions.

3,712,874
TETRANEOPENTYLTITANIUM
Walter M. Kruse, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
No Drawing. Filed Feb. 2, 1971, Ser. No. 112,017
Int. Cl. C07f *7/28*
U.S. Cl. 260—429.5 **1 Claim**

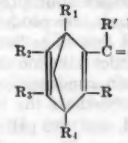
A new and stable organotitanium compound, tetraneopentyltitanium, is described. This new tetraalkyltitanium can be used as the sole catalyst for the polymerization of 1-olefins or it can be used in combination with an activator such as an organoaluminum compound, preferably a dialkylaluminum halide. It can also be extended on a solid support such as silica and used, with or without an activator, as the catalyst for olefin polymerizations.

3,712,875
SYNERGISTIC ADDITIVE SYSTEM FOR ANTI-FOG VINYL FILM
Donatas Tijunelis, Buffalo Grove, Ill., assignor to Union Carbide Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 853,981, Aug. 28, 1969, which is a continuation-in-part of abandoned application Ser. No. 632,895, Apr. 24, 1967. This application Feb. 22, 1971, Ser. No. 117,843
Int. Cl. C08f *21/04*
U.S. Cl. 260—23 EP **11 Claims**

An anti-fog additive system comprising a mixture of two, select, anti-fog additives is incorporated into a thermoplastic film thereby substantially reducing and eliminating the fogging effect in said film.

3,712,876
CURABLE AMORPHOUS OLEFINIC TERPOLYMERS OBTAINED FROM ALPHA-OLEFINS AND POLYENE HYDROCARBON CONTAINING TWO CONJUGATED DOUBLE BONDS AND PROCESS FOR PREPARING SAME
Sergio Arrighetti, Milan, and Arnaldo Roggero, Eugenio Vajna, and Sebastiano Cesca, San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy
No Drawing. Filed Jan. 22, 1971, Ser. No. 109,008
Claims priority, application Italy, Jan. 22, 1970, 19,659/70
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.7 **12 Claims**

A new curable amorphous terpolymer having a high curing rate, which consists of two alpha olefins, e.g. ethylene and propylene, and a polyene having two conjugated double bonds and represented by the formula:



wherein

R is H or alkyl and

R_1, R_2, R_3, R_4, R', R'' and R''' may be H, alkyl or aryl,

is prepared by polymerizing the two alpha olefins and the polyene in the presence of a compound of a transition metal of Groups IV to VIII of the Periodic Table and a reducing aluminum compound represented by the formula:

$$AlR_0X_1X_2 \cdot nZ$$

wherein R_0 is H or a hydrocarbon radical having 1 to 10 C atoms; each of X_1 and X_2, which may be the same or different, is H, a hydrocarbon radical having 1 to 10 C atoms, halogen or a secondary amine radical; Z is a Lewis base; and n is 0–2.

3,712,877

CURABLE VINYLIDENE FLUORIDE ELASTOMERS CONTAINING PHOSPHONIUM CURING AGENTS

Kalyanji U. Patel, St. Paul, and John E. Maier, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company

No Drawing. Continuation-in-part of application Ser. No. 3,396, Jan. 16, 1970, which is a continuation-in-part of application Ser. No. 831,295, June 9, 1969, which is a continuation-in-part of application Ser. No. 802,917, Feb. 27, 1969, which in turn is a continuation-in-part of application Ser. No. 753,618, Aug. 19, 1968. This application July 6, 1971, Ser. No. 160,086

Int. Cl. C08f *29/16, 27/00*

U.S. Cl. 260—87.7 **2 Claims**

A curable vinylidene fluoride elastomer containing a quaternary phosphonium compound as curing agent.

3,712,878

O,O,S-TRIESTERS OF PHOSPHORODITHIOIC ACID AS ACCELERATORS IN THE SULFUR VULCANIZATION OF EPDM RUBBERS

Walter Nudenberg, West Caldwell, Merlin P. Harvey, Passaic, and James U. Mann, Wayne, N.J., assignors to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Aug. 25, 1970, Ser. No. 66,870

Int. Cl. C08f *27/06*

U.S. Cl. 260—79.5 B **8 Claims**

Certain O,O,S-triesters of phosphorodithioic acid are excellent co-accelerators in the sulfur vulcanization of EPDM rubbers.

3,712,879

UREA FORMALDEHYDE CONDENSATION PRODUCTS

Jörg Strickrodt, 39 Heinrich-Spoerlstr., 3011 Laatzen, Germany, and Gerhard Blume, 12 Hermann-Korbstr., 334 Wolfenbuttel, Germany

Filed Apr. 3, 1970, Ser. No. 71,284

Claims priority, application Germany, Apr. 4, 1969, P 19 17 569.0

Int. Cl. C08g *9/10*

U.S. Cl. 260—69 R **4 Claims**

Urea formaldehyde condensation products, suitable for use as long lasting fertilizers, are produced in a two stage condensation process, the first stage being a precondensation stage carried out under alkaline conditions, and the second stage being a main condensation, carried out under acid conditions. Intermediate the two stages, the reaction medium is cooled, and the pH is adjusted to that desired for the second stage. The product of the second stage is dried, for example in a spray drier, rapidly and at a low temperature whereby an increase in insoluble nitrogen is avoided.

3,712,880

ALIPHATIC HYDROCARBON ESTERS AND DERIVATIVES

John B. Siddall, Palo Alto, Calif., and Jean Pierre Calame, Fallanden, Switzerland, assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Division of application Ser. No. 843,818, July 22, 1969, now Patent No. 3,671,558, which is a continuation-in-part of application Ser. No. 800,266, Feb. 18, 1969, which is a continuation-in-part of application Ser. No. 618,351, Feb. 24, 1967, which in turn is a continuation-in-part of applications Ser. No. 579,490, Sept. 15, 1966, Ser. No. 590,195, Oct. 28, 1966, Ser. No. 592,324, Nov. 7, 1966, and Ser. No. 594,664, Nov. 11, 1966, all now abandoned. This application Apr. 3, 1970, Ser. No. 25,581

Int. Cl. C11c *3/00*

U.S. Cl. 260—408 **10 Claims**

Novel aliphatic hydrocarbon esters, acids and alcohols having a backbone of at least 12 carbon atoms, a lower alkyl group at C–3, C–7 and C–11, and unsaturation or saturation at C–2,3; C–6,7 or C–10,11 which are substituted with halo and hydroxy, and the esters and ethers thereof, useful as arthropod maturation inhibitors.

3,712,881

AZOLE DISAZO DYESTUFFS

Hans-Joerg Angliker and Richard Peter, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 716,267, Mar. 12, 1968. This application July 30, 1970, Ser. No. 59,698

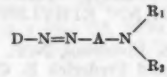
Claims priority, application Switzerland, Mar. 15, 1967, 3,756/67; Aug. 4, 1967, 11,011/67

Int. Cl. C09b *29/36, 33/12, 35/34*

U.S. Cl. 260—158 **9 Claims**

Disazo dyestuffs in which two monoazo dyestuff molecules of the general formula

(I)



in which D represents the residue of a monocyclic or bicyclic diazo component, A represents a para-phenylene residue and R_1 and R_2 each represents an alkyl residue that may be substituted, are linked together through the residues of their coupling components by a bifunctional bridging component Z which has no dyestuff characteristics, and in which only one of the monoazo dyestuff residues is joined to the bifunctional residue Z directly via the aromatic nucleus A.

The dyestuffs are used to dye synthetic fibers such as polyester fibers. The dyeings so obtained are very fast to light and to sublimation.

3,712,882

ORANGE TO RUBINE DISPERSE DISAZO DYES

John Blackwell, Kennett Square, Pa., and Jeanne K. Bauxbaum, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

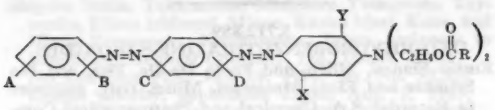
No Drawing. Filed Nov. 6, 1969, Ser. No. 874,722

Int. Cl. C09b *31/04;* **D06p** *1/18, 3/36*

U.S. Cl. 260—187 **5 Claims**

Orange to rubine disperse disazo dyes, useful for dyeing

water swellable cellulosic or synthetic fibers or blends or mixtures thereof, having the formula



wherein

R is phenyl or phenyl with up to two substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, NO_2 and Cl;
X is H, Cl, C_{1-4} alkyl

$$NHC(C_{1-4}\text{ alkyl}) \text{ or } NHCR$$

wherein R is as defined above;
Y is H, C_{1-4} alkyl or C_{1-4} alkoxy;
A is H, Cl, Br or C_{1-4} alkyl;
B is H, Cl, Br, CF_3, CN, C_{1-4} alkyl,

$$C\text{-phenyl}, \quad CN(C_{1-4}\text{ alkyl})(C_{1-4}\text{ alkyl}), \quad CO(C_{1-4}\text{ alkyl}) \text{ or } CO\text{-cyclohexyl}$$

C and D jointly are CH=CH—CH=CH or C is H, C_{1-2} alkyl or C_{1-2} alkoxy and D is H, Cl, C_{1-2} alkyl or C_{1-2} alkoxy.

3,712,883

CARBOXYALKYL ETHERS OF GALACTOMANNAN GUMS

Robert Nordgren, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

No Drawing. Filed Feb. 3, 1970, Ser. No. 8,439

Int. Cl. C07c *47/18*

U.S. Cl. 260—209 R **6 Claims**

A halo fatty acid derived carboxyalkyl ether of galactomannan gum having a degree of substitution of 0.6–2.0. The substituted gum can be reacted with calcium to obtain improved stabilized thickeners and gellants.

3,712,884

PREPARATION OF MONOMETHYL ETHERS OF DIGOXIN

Wolfgang Voigtlander, Viernheim, Hessen, and Fritz Kaiser, Lampertheim, Hessen, Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

No Drawing. Filed Nov. 19, 1970, Ser. No. 91,171

Claims priority, application Germany, Dec. 5, 1969, P 19 61 034.5

Int. Cl. C07c *173/00*

U.S. Cl. 260—210.5 **6 Claims**

Digoxin is reacted with dimethyl sulfate in dimethyl formamide in the presence of barium hydroxide to produce the monomethyl ether. By having aluminum oxide and an inert solvent present, the 4''' ether is produced and by having aluminum isopropylate present the 3'''-ether is produced.

The reaction product is worked up in chloroform and water is used to remove unreacted digoxin which is recycled for further etherification.

3,712,885

PURINE-RIBOFURANOSIDE - 3',5' - CYCLOPHOSPHATES AND PROCESS FOR THEIR PREPARATION

Gunter Weimann, Bergerstrasse 159, Percha, Germany; Erich Haid, Gartenstrasse 5, Weilheim, Germany; Klaus Mühlegger, Riedenerweg 52, Starnberg, Germany; Hans Ulrich Bergmeyer, Brahmsweg 6, Tutzing, Upper Bavaria, Germany; Karl Dietmann, Amalie-Sieveking-Weg 11, Mannheim-Waldhof, Germany; and Gerhard Michal and Michael Nelboeck-Hochstetter, both of Bahnhofstrasse 5a, Tutzing, Upper Bavaria, Germany

No Drawing. Filed Sept. 8, 1969, Ser. No. 9,468

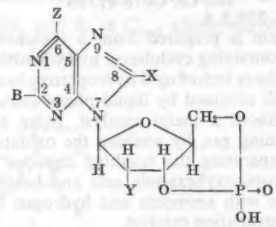
Claims priority, application Germany, Sept. 10, 1968, P 17 95 308.1; Apr. 30, 1969, P 19 22 172.8; Apr. 3, 1969, P 19 22 173.9

(Filed under Rule 47(a) and 35 U.S.C. 116)

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **30 Claims**

Novel purine-ribofuranoside-3',5'-cyclophosphate compounds of the formula:



wherein B is a hydrogen atom or a hydroxyl or amino group; Z is a halogen atom, an ether group or a mono- or disubstituted amino group when X is a hydrogen atom and otherwise Z is a hydrogen atom, a hydroxyl group or an unsubstituted amino group, Y is a hydroxyl group or, when X is other than a hydrogen atom, Y is a hydrogen atom and X is a hydrogen or halogen atom, a hydroxyl group, an ether group, a sulphhydryl group, a thioether group or an unsubstituted or substituted amino group; and the salts thereof, are provided; these compounds can be prepared by reacting the corresponding cyclophosphate wherein Y and Z in the above formula are hydroxy, and X is hydrogen, with (a) phosphorus oxyhalide after acylation or (b) molecular halogen in alkaline medium, to form the corresponding (a) 6-halo or (b) 8-halo compound, and the 6- or 8-halo compound thereby obtained is converted, if necessary, into the corresponding desired compound by, e.g., reacting the halo compound with an alcohol or alcoholate to give the corresponding ether; or with ammonia or an amine to give the corresponding amino compound; or with hydrazine to give the corresponding hydrazide; or with thiourea or an alkyl sulfide to give the corresponding sulphhydryl compound, which can in turn be converted to the thioether compounds.

3,712,886

METHOD FOR PREPARING CELLULOSE ETHER DERIVATIVES

Shunichi Koyanagi, Kinya Ogawa, Yoshiro Onda, and Akira Yamamoto, Naoetsu, Japan, assignors to Shinetsu Chemical Company, Chicago, Ill.

No Drawing. Filed Feb. 24, 1971, Ser. No. 118,555

Claims priority, application Japan, Mar. 6, 1970, 45/19,553

Int. Cl. C08b *11/00*

U.S. Cl. 260—226 **11 Claims**

Cellulose ether represented by the general formula:

$$R_m^1R_n^2A$$

(where R^1 is a hydroxyalkyl radical having 3 or 4 carbon atoms, R^2 is a hydrogen atom or an alkyl radical of 1 or 2 carbon atoms, *m* and *n* are positive integers and A a cellulose residue) is reacted, in an organic acid medium, with tetrahydrophthalic anhydride, hexahydrophthalic anhydride or their mixture or a mixture of one of these three and other dibasic and/or tribasic anhydrides, in the presence of an anhydrous alkali metallic salt of acetic acid acting as the catalyst. A cellulose ether derivative thus obtained is a novel substance characterized by high solubility both in organic solvents and alkalis, as well as superior moisture permeability resistance and stability, so that it is useful as a tablet-coating material and a base for paints.

3,712,887
PROCESS FOR PREPARING ε-CAPROLACTAM
Yves Colleuille and Roger J. Gardon, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France
No Drawing. Filed Oct. 2, 1970, Ser. No. 77,751
Claims priority, application France, Oct. 3, 1969, 6933860
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 A **8 Claims**

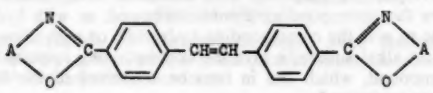
ε-Caprolactam is prepared from a cyclohexane oxidation product containing cyclohexyl hydroperoxide and oxidation by-products including 6-hydroperoxy-hexanoic acid, which has been obtained by liquid phase oxidation of cyclohexane, without a metal catalyst, using a molecular oxygen containing gas, by washing the oxidation product with water, separating the resulting aqueous phase containing 6-hydroperoxyhexanoic acid and heating the acid under pressure with ammonia and hydrogen in the presence of a hydrogenation catalyst.

ERRATUM

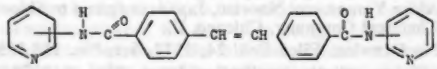
For Class 260—240 see:
Patent No. 3,712,982

3,712,888
BIS-PYRIDOXAZOLE-STILBENE DERIVATIVES FOR OPTICAL BRIGHTENING
Henry Xavier Kaempfen, Hillsboro Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Original application Jan. 27, 1969, Ser. No. 794,378. Divided and this application Dec. 14, 1970, Ser. No. 98,120
Int. Cl. C09b *23/00*
U.S. Cl. 260—240 CA **2 Claims**

A novel class of heterocyclic stilbene derivatives have outstanding properties as optical brightening agents. The new compounds are bis-pyridoxazole-stilbenes of the formula:



where each A represents a pyrido ring attached through two adjacent carbon atoms thereof to N and O, respectively, and where the pyrido rings and the phenylene rings may be substituted. New intermediates for the preparation of the brightener compounds are bis-amides of the formula:

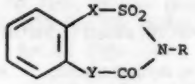


wherein each pyridine ring carries a halo or a hydroxyl radical in a position ortho to the point of attachment of the

bond and may be further substituted and wherein the phenylene rings may also be substituted.

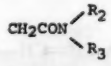
3,712,889
OXODIHYDROBENZOTHIAZINE-S-DIOXIDES
Enrico Sianesi, Milan, and Paolo Da Re, Pisa, and Ivo Setnikar and Elena Massarani, Milan, Italy, assignors to Recordati S.A. Chemical and Pharmaceutical Company, Lugnano, Switzerland
No Drawing. Filed May 11, 1970, Ser. No. 36,477
Int. Cl. C07d *93/02*
U.S. Cl. 260—243 R **4 Claims**

A 3- or 4-oxo-dihydrobenzothiazine-S-dioxide of the general formula:



(I)

in which either X or Y stand for a single bond and the other stands for methylene (CH_2) and R represents hydrogen or alkyl, alkenyl, propargyl, benzyl, carbethoxy, dialkyl aminoalkyl or cycloaminoalkyl or a group of the formula $—CH_2—COOR_1$, in which R_1 represents hydrogen or alkyl, dialkylaminoalkyl or cycloaminoalkyl, or R represents a group of the formula:



(II)

in which R_2 and R_3 are identical or different and each represent hydrogen, alkyl or alkenyl or dialkylaminoalkyl or cycloamino-alkyl group or, together with the nitrogen atom to which they are attached, form a heterocyclic amino group, or R represents an unsubstituted phenyl or a chloro-substituted or sulfamyl-substituted phenyl and methods for the preparation thereof. These compounds are therapeutically active particularly on the central nervous system, e.g., hypnotic activity.

3,712,890
PROCESS FOR MAKING 2-ARYLOXYMETHYI MORPHOLINES
Stanley Arnold Lee, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed June 8, 1970, Ser. No. 44,644
Claims priority, application Great Britain, June 20, 1969, 31,255/69; Oct. 13, 1969, 50,130/69
Int. Cl. C07d *87/46*
U.S. Cl. 260—247.7 C **10 Claims**

A process for the manufacture of 2 - aryloxymethyl morpholine derivatives, known to possess useful central nervous depressant activity, by the cyclisation of the corresponding 1 - aryloxy - 3 - β - substituted ethylamino-2-propanol derivative in which the β-substituent is a displaceable radical. This process avoids the use of hazardous complex metal hydrides employed in the prior art process.

3,712,891
CHLORINATION OF CYANURIC ACID
Sidney Berkowitz, Highland Park, and Raymond N. Mesiah, Somerset, N.J., assignors to FMC Corporation, New York, N.Y.
No Drawing. Filed July 21, 1971, Ser. No. 164,948
Int. Cl. C07d *55/40*
U.S. Cl. 260—248 C **4 Claims**

This invention provides a process for producing chloroisocyanuric acids by reacting cyanuric acid and hypochlorous acid in an aqueous medium at a temperature of 0° C. to 50° C. The process is capable of producing chloroisocyanuric acids without producing a salt as a co-product of chlorination.

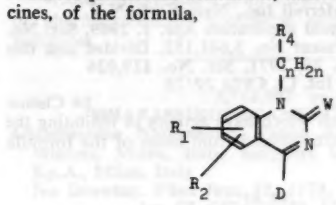
3,712,892

QUINAZOLINONE DERIVATIVES

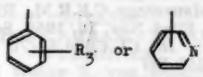
Shigeho Inaba, Takarazuka, Michihiro Yamamoto, Toyonaka, Kikuo Ishizumi, Minoo, Kazuo Mori, Kobe, and Hisao Yamamoto, Nishinomiya, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed July 29, 1970, Ser. No. 59,337
Claims priority, application Japan, Aug. 2, 1969, 44/61,222; Aug. 4, 1969, 44/61,872; Sept. 4, 1969, 44/70,453; Dec. 8, 1969, 44/98,836; Dec. 9, 1969, 44/99,196; Dec. 19, 1969, 44/102,810; Jan. 23, 1970, 45/6,531; Jan. 24, 1970, 45/6,628; Feb. 17, 1970, 45/14,069
Int. Cl. C07d 51/48
U.S. Cl. 260—251 QB 19 Claims

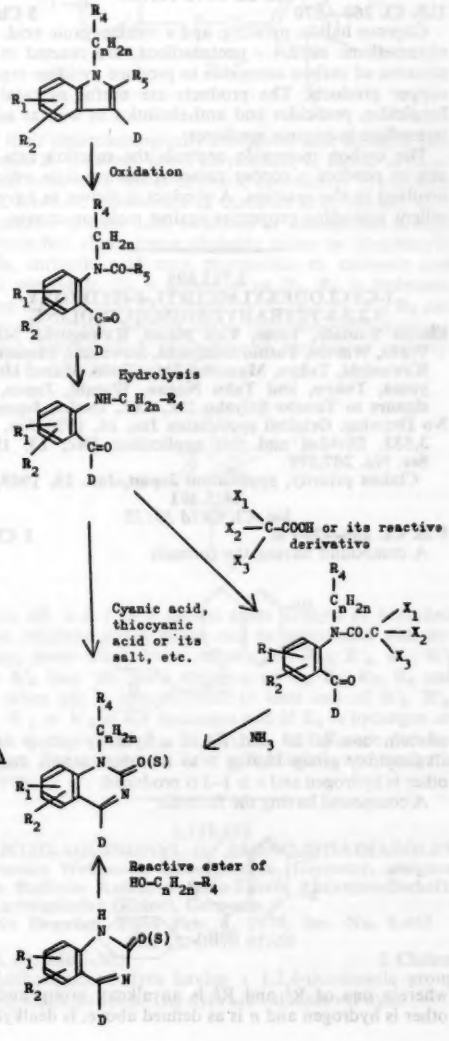
Novel quinazoline derivatives, which are useful as medicines, of the formula,



wherein D is a group of the formula



n is 0 or an integer of 1 to 3; R_1, R_2 and R_3 each is hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, nitro, trifluoromethyl, etc.; R_4 is C_{3-6} cycloalkyl; and W is oxygen or sulfur. These quinazoline derivatives are produced by any of reactions as shown in the following reaction schema; wherein D, *n*, R_1, R_2, R_4 and W are the same as defined below, and R_5 is C_{1-4} alkoxy-carbonyl, carboxy, carbamoyl or cyano.

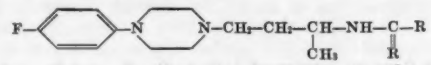

Oxidation
Hydrolysis
NH3
Cyanic acid, thiocyanic acid or its salt, etc.
COCl2 or cyanic acid, thiocyanic acid, or its salt, etc.
Reactive ester of HO-CnH2n-R4

3,712,893
BUTYL-PIPERAZINE DERIVATIVES

Roland Yves Mauvernay, Riom, Norbert Busch, Loubeyrat, Jacques Simond, Chamalieres, and Jacques Moleyre, Mozac, France, assignors to S.A. Centre Europeen de Recherches Mauvernay C.E.R.M., Riom, France

No Drawing. Filed Nov. 10, 1969, Ser. No. 875,504
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 PH **1 Claim**

A compound of the formula



in which R is a phenyl group substituted in the para-position by a halogen atom or furyl or pyridyl or a physiologically acceptable acid addition salt thereof.

3,712,894
PYRIDINE-ORGANOCOPPER PRODUCT AND PREPARATION

William G. Billings, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

No Drawing. Filed July 28, 1969, Ser. No. 845,525
Int. Cl. C07d *105/00*
U.S. Cl. 260—270 **3 Claims**

Cuprous halide, pyridine, and a weak organic acid, e.g., nitromethane or 2,4 - pentanedione, are reacted in the presence of carbon monoxide to produce pyridine-organocopper products. The products are useful as catalysts, fungicides, pesticides and anthelmintics as well as an intermediate in organic syntheses.

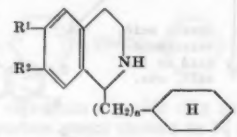
The carbon monoxide controls the reaction rate and acts to produce a copper carbonyl intermediate which is involved in the reaction. A product is shown to have excellent protecting properties against mold on canvas.

3,712,895
1-CYCLOHEXYLMETHYL-6-HYDROXY-1,2,3,4-TETRAHYDROISOQUINOLINE

Eisaku Yamato, Yono, Yuji Miura, Kawaguchi, Masao Wada, Warabi, Toshio Sekiguchi, Kawasaki, Masazumi Kawanishi, Tokyo, Masanori Sato, Toda, Masao Hoshiyama, Tokyo, and Taku Nagao, Warabi, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

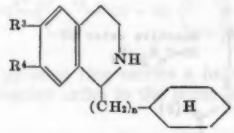
No Drawing. Original application Jan. 16, 1970, Ser. No. 3,533. Divided and this application Dec. 13, 1971, Ser. No. 207,599
Claims priority, application Japan, Jan. 25, 1969, 44/5,491
Int. Cl. C07d *35/28*
U.S. Cl. 260—289 R **1 Claim**

A compound having the formula



wherein one of R^1 and R^2 is a hydroxy group or an alkanoyloxy group having 1 to 6 carbon atoms and the other is hydrogen and n is 1–3 is produced.

A compound having the formula



wherein one of R^3 and R^4 is an alkoxy group and the other is hydrogen and n is as defined above, is dealkylated to produce a 1-substituted-6- or -7-hydroxy-1,2,3,4-tetrahydroisoquinoline compound. When R^1 or R^2 is alkanoyloxy, the hydroxyl group of said 1-substituted-6- or -7-hydroxy-1,2,3,4-tetrahydroisoquinoline compound is selectively acylated with an alkanoyl halide having 1–6 carbon atoms.

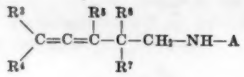
The compounds of the present invention are useful as peripheral vasodilators.

3,712,896
ALLENE POLYAMINES

Charles H. Tilford, Atlanta, Ga., and Thomas R. Blohm and Robert D. McKenzie, Cincinnati, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

No Drawing. Original application Apr. 1, 1969, Ser. No. 812,408, now Patent No. 3,641,155. Divided and this application Feb. 25, 1971, Ser. No. 119,026
Int. Cl. C07d *29/28*
U.S. Cl. 260—293.87 **16 Claims**

Novel compounds which have activity in inhibiting the clotting of blood are selected from bases of the formula



Formula I

wherein:

(A) R^3 is hydrogen, (lower)alkyl or (lower)alkenyl;

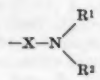
(B) R^4 is (lower)alkyl or (lower)alkenyl;

(C) R^3 and R^4 taken together with the carbon atom to which they are attached is cycloalkyl of 5 to 7 ring carbon atoms;

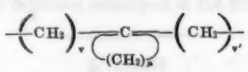
(D) R^5 is hydrogen or (lower)alkyl;

(E) each of R^6 and R^7 is (lower)alkyl, (lower)alkenyl, or R^6 and R^7 together with the carbon atom to which they are attached is (i) cycloalkyl of 5 to 7 ring carbon atoms; (ii) cycloalkenyl of 5 to 7 ring carbon atoms; or (iii) bicycloalkyl selected from bornyl, norbornyl or norbornenyl;

(F) A is the group (i)

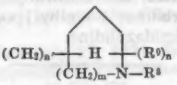


wherein X is alkylene of 2 to about 8 carbon atoms and separates the adjacent nitrogen atoms by an alkylene chain of at least 2 carbon atoms, monohydroxy alkylene of 3 to about 8 carbon atoms, and separates the adjacent nitrogen atoms by an alkylene chain of at least 3 carbon atoms, or a cycloalkyl-substituted alkylene group of the formula



wherein each of v and v' is an integer of 0 to 4, μ is an integer of 3 to 5 provided that at least one of v and v' is 1, and the total of v, v' and μ is not greater than 8, R^1 is hydrogen, (lower)alkyl, phenyl, hydroxy(lower)alkyl, cycloalkyl of 4 to 6 ring carbon atoms, di(lower)alkylamino(lower)alkyl, pyridyl(lower)alkyl, piperidyl(lower)alkylamino(lower) alkyl, or piperidyl(lower)alkyl, R^2 is hydrogen, (lower)alkyl or hydroxy(lower)alkyl, or R^1 and R^2 taken together with the nitrogen to which they are attached is piperazino, N-(lower)alkylpiperazino,

morpholino, pyrrolidino, aziridino, piperidino, (lower)alkylpiperidino, (lower)alkylimidazolidino, or (ii) A is



wherein n' is an integer of 0 to 3, m is an integer of 1 or 2, R^8 is hydrogen, (lower)alkyl, (lower) alkenyl, hydroxy(lower)alkyl, phenyl(lower)alkyl, cyano(lower)alkyl, piperidino(lower)alkyl, R^9 is (lower)alkyl; and n is an integer of 0 to 4;

or pharmacologically acceptable acid addition salts of said bases.

3,712,897

TRIAZASPIRODECANEDITHIONES

Giangiacomo Nathansohn, Vanna Aresi, and Giorgio, Winters, Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

No Drawing. Filed June 10, 1970, Ser. No. 45,212

Int. Cl. C07d *29/36, 57/00*

U.S. Cl. 260—293.66 **6 Claims**

Triazaspirodecanedithione compounds, such as 1,3,8-trimethyl - 1,3,8 - triazaspiro[4,5]decane - 2,4 - dithione and 1,3-dimethyl - 8 - cyclohexyl - 1,3,8 - triazaspiro[4,5] decane-2,4-dithione, are prepared by the reaction of an N-substituted 4-piperidone with an alkali metal chloride, ammonium chloride and carbon disulfide. The novel compounds are useful as antiinflammatory agents.

3,712,898

BENZOHETEROCYCLICALKYL DERIVATIVES OF 4-(2-KETO-1-BENZIMIDAZOLINYL)-PIPERIDINE

Carl Kaiser, Haddon Heights, N.J., and Charles L. Zirkle, Berwyn, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Oct. 28, 1968, Ser. No. 771,320, now Patent No. 3,629,267, dated Dec. 21, 1971. Divided and this application Mar. 10, 1971, Ser. No. 123,090

Int. Cl. C07d *99/04, 99/06*

U.S. Cl. 260—293.57 **5 Claims**

Benzoheterocyclicalkyl derivatives of 4-(2-keto-1-benzimidazolinyl)-piperidine, in which the benzoheterocyclic moiety is thianaphthenyl or benzofuranyl, optionally substituted by chloro, bromo, fluoro, methyl, methoxy or trifluoromethyl, have neuroleptic activity. The compounds are generally prepared from either the benzoheteroyclicalkyl halide by reaction with the appropriate amine or the benzoheterocyclic amine by condensation with a 5,5-bis-(β-haloethyl)barbituric acid.

3,712,899

p-AMINOALKYLBENZENESULFONAMIDE DERIVATIVES

Henri Dietrich, Arlesheim, Basel-Land, and Claude Lehmann, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Basel, Switzerland

No Drawing. Filed Sept. 1, 1970, Ser. No. 68,794

Claims priority, application Switzerland, Sept. 4, 1969, 13,399/69

Int. Cl. C07d *49/30, 57/00*

U.S. Cl. 260—294.8 F **6 Claims**

Compounds of the class of 1 - [p-(carboxamidoalkyl)-phenylsulfonyl] - 2 - imino-imidazolidines and the pharmaceutically acceptable acid addition salts thereof have hypoglycemic activity; these compounds are active ingredients of pharmaceutical compositions and are useful for the treatment of diabetes mellitus; a typical embodiment is 1 - [p-(2-(3-furancarboxamido)-ethyl)-phenylsulsulfonyl]-2-imino-3-cyclohexyl-imidazolidine.

3,712,900

BENZYL AMINO CARBAMATE SUBSTITUTED PYRIDINES

Kurt Thiele and Walter E. von Bebenburg, Frankfurt, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Continuation-in-part of applications Ser. No. 637,322, May 10, 1967, and Ser. No. 762,321, Sept. 16, 1968. This application July 11, 1969, Ser. No. 842,438

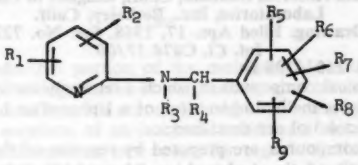
Claims priority, application Germany, July 16, 1968, P 17 70 892.8; Aug. 20, 1968, P 17 95 180.3

The portion of the term of the patent subsequent to May 19, 1987, has been disclaimed

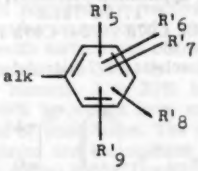
Int. Cl. C07d *31/44*

U.S. Cl. 260—295.5 C **9 Claims**

There are prepared pharmacological compounds of the formula



and their pharmacologically acceptable acid addition salts wherein R_1 is amino, lower alkylamino, or amino acylated by carbonic acid, lower aliphatic monoesters of carbonic acid, aromatic monoesters of carbonic acid, benzoic acid, substituted benzoic acid, saturated or unsaturated straight or branched chain lower aliphatic mono or dicarboxylic acids, carbonic acid semi morpholide or carbonic acid semi piperidide, R_2 is hydrogen or R_1, R_3 is hydrogen, lower alkyl or acyl as defined for R_1, R_5, R_6, R_7, R_8 and R_9 are hydrogen, halogen, alkyl, trifuoromethyl, hydroxy, alkoxy, hydroxyalkyl, aliphatic acyl, carboxy or carboxyalkyl, R_4 is hydrogen, alkyl or



where alk is a 1 to 3 carbon atom straight or branched chain alkylene group which can be substituted with hydroxy, lower alkyl, lower alkoxy and R'_5, R'_6, R'_7, R'_8 and R'_9 have the same meaning as R_5, R_6, R_7, R_8 and R_9, when alk is unsubstituted at least one of R'_5, R'_6, R'_7, R'_8 or R'_9 is not hydrogen and if R_4 is hydrogen or alkyl at least 3 of R_5, R_6, R_7, R_8 and R_9 are not hydrogen. The compounds have antiphlogistic and analgesic activity.

3,712,901

5-ANTHRAQUINONYL (1) AMINO-THIADIAZOLES

Hermann Weissauer, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Feb. 6, 1970, Ser. No. 9,445

Int. Cl. C07d *91/60*

U.S. Cl. 260—303 **2 Claims**

Anthraquinone dyes having a 1,2,4-thiodiazole group in the alpha-position. The dyes are valuable vat dyes.

3,712,902
TETRAKIS(POLYFLUOROMETHYL)-4-OXAZOLIDINONES

William J. Middleton, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 636,019, May 4, 1967. This application Aug. 5, 1969, Ser. No. 847,723

The portion of the term of the patent subsequent to Mar. 21, 1984, has been disclaimed and dedicated to the Public

Int. Cl. C07d *85/30, 85/36*

U.S. Cl. 260—307 A 4 Claims

Described are 4-oxazolidinones having acylic polyhalomethyl substituents containing some fluorine in the 2- and 5-positions, e.g., 2,5-bis(difluoromethyl)-2,5-bis(trifluoromethyl)-4-oxazolidinone. These compounds exhibit strong herbicidal action.

3,712,903
5[1-(PHENYL OR BENZYL)-1H-INDAZOL-3-YLOXYMETHYL]-TETRAZOLES

Laszlo Ambrus, Oakland, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

No Drawing. Filed Apr. 17, 1968, Ser. No. 722,824

Int. Cl. C07d *57/00*

U.S. Cl. 260—308 D 9 Claims

Chemical compounds in which a tetrazolylmethyl radical replaces the hydrogen atom of a 1-phenyl or 1-benzyl-1H-indazol-3-ol are described.

The compounds are prepared by reaction of the alkali metal salt of the 1-phenyl or 1-benzyl-1H indazol-3-ol with a haloalkyl cyanide followed by the reaction of the cyano group with an alkali metal azide under conditions which converts the cyano group to a tetrazole.

The compounds possess anti-inflammatory activity as demonstrated by the limb volume test.

3,712,904
7-TRIAZOLYL-COUMARINS

Klaus-Dieter Bode, Leverkusen, and Carl-Wolfgang Schellhammer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

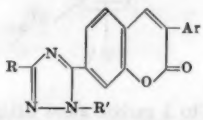
No Drawing. Filed June 18, 1969, Ser. No. 834,504

Claims priority, application Germany, June 26, 1968, P 17 70 711.8

Int. Cl. C07d *99/04;* C09k *1/02*

U.S. Cl. 260—308 R 2 Claims

This invention relates to 7-triazolyl-coumarins of the formula



in which Ar and R denote an optionally substituted aromatic or heteroaromatic radical and R′ denotes hydrogen or an optionally substituted alkyl radical, and the coumarin ring may contain further substituents. These materials are used as optical brightening agents.

3,712,905
p-CARBAMOYLETHYLPHENYLSULFONYL DERIVATIVES

Henri Dietrich, Arlesheim, Basel-Land, and Claude Lehmann, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Basel, Switzerland

No Drawing. Filed Sept. 1, 1970, Ser. No. 68,795

Claims priority, application Switzerland, Sept. 4, 1969, 13,398/69

Int. Cl. C07d *49/30, 57/00*

U.S. Cl. 260—309.7 3 Claims

Compounds of the class of 1-[p-carbamoylethylphenylsulfonyl]-2-imino-imidazolidines and the pharmaceutically acceptable acid addition salts thereof have hypoglycemic activity; the compounds are active ingredients of pharmaceutical compositions and can be used for the treatment of diabetes; and illustrative embodiment is 1-[p-[2 - (propylcarbamoyl) - ethyl] - phenylsulfonyl]-2-imino-3-sec.butyl-imidazolidine.

3,712,906
DERIVATIVES OF 4-(AMINOETHANE-SULFONYL-AMINO)-ANTIPYRINE

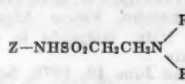
Shun-Ichi Naito, 35 Murasakino Kamitorida-cho, Kyoto, Japan

No Drawing. Continuation-in-part of application Ser. No. 778,792, Nov. 25, 1968. This application Feb. 10, 1969, Ser. No. 798,184

Int. Cl. C07d *49/16*

U.S. Cl. 260—294.8 F 13 Claims

Analgesic-antipyretic compounds are provided which are derivatives of 4-(aminoethanesulfonylamino)-antipyrine and aminoethanesulfonyl-p-phenetidine of the formula:



wherein Z is 4-antipyryl or p-ethoxyphenyl and R^1 and R^2 are each hydrogen, alkyl or acyl. Intermediates and administrable compositions are disclosed. The compounds form stable aqueous solutions retaining practically full activity.

3,712,907
PROCESS FOR THE PRODUCTION OF SUBSTITUTED PHTHALIMIDO-N-CARBOXYLIC ACIDS

Heinrich Gilch and Ludwig Bottenbruch, Krefeld-Bockum, Wilfried Zecher, Cologne-Stammheim, and Rudolf Merten, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 7, 1969, Ser. No. 822,738

Claims priority, application Germany, May 15, 1968, P 17 70 416.4

Int. Cl. C07d *27/52*

U.S. Cl. 260—326 A 6 Claims

Process for the production of substituted phthalimido-N-carboxylic acids by reaction of a lactam having more than 3 ring members with a phthalic acid anhydride derivative being substituted by an electrophilic substituent which is more electronegative than hydrogen.

3,712,908
1,2-DITHIOLONES HAVING SULPHUR-CONTAINING SUBSTITUENTS

Jorg Bader, Alesheim, Basel-Land, and Karl Gatzi, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Application June 5, 1967, Ser. No. 643,359, now Patent No. 3,546,235, dated Dec. 8, 1970, which is a continuation-in-part of application Ser. No. 555,994, June 8, 1966. Divided and this application Aug. 5, 1970, Ser. No. 61,476

Claims priority, application Switzerland, June 18, 1965, 8,566/65; May 29, 1966, 7,421/66

Int. Cl. A61k *27/00;* C07d *71/00*

U.S. Cl. 260—327 C 23 Claims

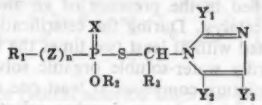
1,2-dithiol-3-ones having substituents which comprise certain organic radicals bonded to the 5-position of the dithiolone nucleus via a sulphur atom which may be mono- or dioxidized, which are of excellent microbicidal activity especially against fungi and bacteria; a novel process for the production of those of the new compounds in which the bridge is a sulphur or mono-oxidized sulphur bridge; methods of inhibiting microbial growth with the aid of the novel compounds, and antimicrobial compositions containing the latter as active ingredients.

3,712,909
IMIDAZOLYL-ALKYL-THIOPHOSPHATES AND THIOPHOSPHONATES

Jozef Drabek, Basel, Switzerland, and Georg Pissiotas, Loerrach, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed July 27, 1971, Ser. No. 166,589
Claims priority, application Switzerland, Aug. 5, 1970, 11,779/70
Int. Cl. C07d 49/36
U.S. Cl. 260—309 9 Claims

Compounds of the formula



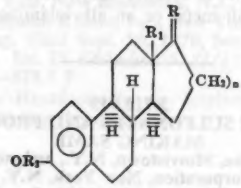
wherein R_1 and R_2 are each C_{1-4} alkyl, n is 0 or 1, X and Z are each oxygen or sulphur, R_3 is hydrogen or methyl and Y_1, Y_2, or Y_3 are each chlorine or bromine are useful for combating insects, phytopathogenic fungi and representatives of the order Acarina.

3,712,910
STEREOSPECIFIC METHOD FOR PREPARING ESTRANE COMPOUNDS OF NATURAL CONFIGURATION

Tatyana Andreevna Serebryakova, Ardalion Vladimirovich Zakharychev, Rimma Nuriakhmetovna Chigir, Sofia Nikolaevna Anachenko, Igor Vladimirovich Torgov, and Evgenia Georgievna Krjutchenko, Moscow, U.S.S.R., assignors to Institut Khimii Prirodnykh Soldineny Akademii Nauk SSSR, Moscow, U.S.S.R.

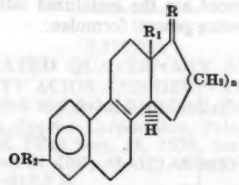
No Drawing. Filed Feb. 24, 1971, Ser. No. 118,550
Int. Cl. C07c 167/12
U.S. Cl. 260—397.5 6 Claims

The present invention relates to a stereospecific method for preparing estrane compounds of natural configuration having the following general formula



wherein R represents O, OH, $OCOCH_3$; R_1 represents H, CH_3, C_2H_5, n-C_3H_7; R_2 represents H, CH_3, $COCH_3$; n is an integer between 1, and 2.

The said method comprises subjecting $\Delta^{8(9)}$-dehydroestrone compounds of the general formula:



wherein R represents O, OH, $OCOCH_3$; R_1 represents CH_3, C_2H_5, n-C_3H_7; R_2 represents H, CH_3; $COCH_3$; n is an integer between 1 and 2, to a reduction process with a mixture of trifluoroacetic acid with triethylsilane in an inert organic medium such as benzene or methylene chloride and isolating the desired product.

The indicated method is applied in the synthesis of female sex hormone-d and d,l-estradiol-3,17β and its analogues, in the synthesis of 19-norsteroids, contraceptive and anabolic preparations.

3,712,911
METALLIZED ISOCYANIDES

Ulrich Schoellkopf, Bovenden, and Fritz Gerhart, Gottingen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Oct. 20, 1969, Ser. No. 867,941
Int. Cl. C07c 119/02
U.S. Cl. 260—464 8 Claims

α-Metalated isocyanides containing the radical

as an essential portion of the molecule. Me stands for alkali or an equivalent of magnesium, zinc or cadmium. Their manufacture is accomplished by replacing hydrogen on the α-carbon of an isocyanide with said metals. The compounds open up new routes for organic synthesis and therefore have outstanding importance as intermediates, e.g. for the manufacture of olefins, amino acids and heterocycles.

3,712,912
PROCESS FOR PREPARING ACRYLONITRILE

Arnold Hausweiler, Zons, and Gunter Beilstein, Adolf Mayer, and Nikolaus Paris, Dormagen, Germany, assignors to Erdolchemie Gesellschaft mit beschrankter Haftung, Cologne, Germany

No Drawing. Filed Feb. 17, 1971, Ser. No. 116,238
Claims priority, application Germany, Apr. 24, 1970, P 20 19 996.6
Int. Cl. C07c 121/02, 121/32
U.S. Cl. 260—465.3 6 Claims

Acrylonitrile is prepared by reacting propylene, ammonia, and molecular oxygen or air, on a supported catalyst having a specific surface area of from 5 to 30 $m.^2/g.$, and containing more than 50% by weight carrier, 6 to 26% by weight bismuth, 2 to 20% by weight molybdenum, 0.5 to 10% by weight iron, and optionally 0.1 to 1% by weight of phosphorus. The reaction gas mixture is free of steam and the reaction is carried out at a temperature of 400 to 500° C. under pressure of 1 to 4 atmospheres for a period of 5 to 15 seconds. In addition an oxygen concentration of less than 1 volume percent is maintained in the gaseous reaction product mixture.

3,712,913
ALKENYLTHIOBENZOIC ACIDS

Madhukar Subraya Chodnekar, Basel, Albert Pfiffner and Norbert Rigassi, Arlesheim, Ulrich Schwieter, Reinach, Basel-Land, and Milos Suchy, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,296
Claims priority, application Switzerland, Apr. 30, 1969, 6,597/69
Int. Cl. C07c 149/40
U.S. Cl. 260—470 12 Claims

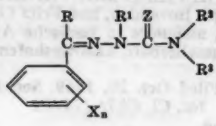
Alkyl or alkenyl ethers or thioethers of benzene or benzyl derivatives wherein the alkyl or alkenyl radical contains a chain of eight or nine carbon atoms, which are useful in killing and preventing the proliferation of insects by upsetting their hormone balance.

3,712,914
ARYLIDENE SEMICARBIZIDES

Harry Tilles, El Cerrito, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application Nov. 5, 1968, Ser. No. 773,657. Divided and this application May 14, 1970, Ser. No. 48,732
Int. Cl. C07c *125/06*
U.S. Cl. 260—479 C 7 Claims

Substituted-arylidene semicarbizide compounds having the formula:



in which Z represents oxygen or sulfur; X represents halogen, lower alkoxy, lower alkyl, hydroxyl, nitro, cyano, N-allylcarbamoyloxy, lower-dialkylthiophosphoryloxy, N-lower alkylcarbamoyloxy, lower dialkylamino, or $(CH_3)_3N^+I^-$; *n* represents an integer of from 0 to 3, inclusive; R represents hydrogen or lower alkyl; R^1 represents hydrogen or lower alkyl; R^2 represents hydrogen, lower alkyl or allyl; R^3 represents hydrogen, alkyl, allyl, furfuryl, tetrahydrofurfuryl, lower alkoxy lower alkyl, cyclohexyl, 2-chloroallyl, phenyl, benzyl, or substituted-phenyl in which the substituents are chloro or nitro; R^2 and R^3 when taken together represent an alkylene containing 4 to 6 carbon atoms, inclusive, or lower alkyl substituted alkylene containing 5 to 8 carbon atoms, inclusive. The compounds are useful as herbicides.

3,712,915
INDANYL-N-METHYL-CARBAMIC ACID ESTERS

Alfred Seyberlich, Cologne-Stammheim, Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 23, 1969, Ser. No. 827,155
Claims priority, application Germany, May 25, 1968, P 17 68 555.1
Int. Cl. C07c *125/06*
U.S. Cl. 260—479 C 3 Claims

Indanyl-N-methyl-carbamic acid esters, i.e. 2-alkyl-(optionally 1-, 2- and /or 7- monoto tetra-alkyl substituted)-indan-4-yl-N-methyl-carbamic acid esters and 7-alkyl-indan-4-yl-N-methyl carbamic acid esters, which possess arthropodicidal, especially acaricidal and insecticidal, properties and which may be produced by conventional methods.

3,712,916
PREPARATION OF HYDROXYL TERMINATED POLYMERS

Alan R. Siebert, Maple Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Original application May 22, 1968, Ser. No. 731,281, now Patent No. 3,551,471. Divided and this application July 2, 1970, Ser. No. 52,125
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 R 3 Claims

Hydroxyl terminated polymers, useful as adhesives and caulking materials are prepared by the reaction of carboxyl terminated polymers with ethylene oxide in the presence of a tertiary amine catalyst.

3,712,917
PROCESS FOR SEPARATING UNSATURATED FATTY ACIDS

Ryozi Sato, Yokohama, and Yasuyoshi Chino, Tokyo, Japan, assignors to The Japanese Geon Co., Ltd.

No Drawing. Filed July 13, 1970, Ser. No. 54,559
Claims priority, application Japan, July 17, 1969, 44/56,086
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 8 Claims

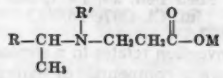
A dilute aqueous solution of acrylic or methacrylic acid, containing less than 70 percent by weight of the acid, is esterified in the presence of an alcohol and an esterification catalyst. During the esterification, the solution is contacted with at least two times the weight of the acid of a hardly water-soluble organic solvent mixture. The solvent mixture comprises at least one saturated hydrocarbon and at least one member selected from the group consisting of aromatic hydrocarbons, ethers and ketones. The resulting ester of the acid is thereby transferred to the solvent mixture.

3,712,918
AMPHOTERIC SURFACE-ACTIVE AGENTS

Zdzislaw W. Dudzinski, Clifton, N.J., and Reginald L. Wakeman, Philadelphia, Pa., assignors to Millmaster Onyx Corporation, New York, N.Y.

No Drawing. Original application Dec. 14, 1970, Ser. No. 98,144. Divided and this application May 31, 1972, Ser. No. 258,301
Int. Cl. C07c *101/12*
U.S. Cl. 260—501.11 1 Claim

This invention relates to amphoteric surface-active agents having the general structure:



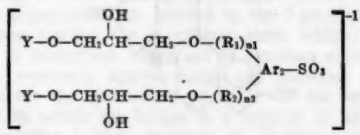
wherein R is a straight chain alkyl having from 6 to 16 carbon atoms, R′ is a lower alkyl, and M is either hydrogen, an alkali metal or an alkylolamine.

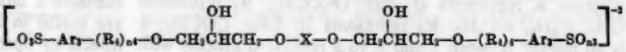
3,712,919
AROMATIC SULFONATES AND PROCESS FOR MAKING SAME

Charles V. Juelke, Morristown, N.Y., assignor to Celanese Corporation, New York, N.Y.

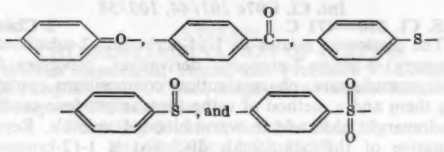
No Drawing. Filed Apr. 14, 1970, Ser. No. 28,542
Int. Cl. C07c *143/42*
U.S. Cl. 260—512 R 7 Claims

Aromatic sulfonates, process for producing same based upon the reaction of an organic compound containing at least one epoxy group with an aromatic sulfonate containing at least one aromatic hydroxy group, and film- and fiber-forming polyesters containing these sulfonates and having an affinity for basic dyes. Among the novel sulfonates produced are the metallized salts of an anion having the following general formulae:





wherein Ar_2 is a trivalent aromatic radical which may be substituted or unsubstituted; Ar_3 is a divalent aromatic radical which may be substituted or unsubstituted; n_1, n_2, and n_4 independently are integers which are either 0 or 1; R_1, R_2 and R_4 are divalent radicals independently selected from the group consisting of alkarylene, arylene,



X is a divalent radical selected from the group consisting of alkylene, cycloalkylene, aralkylene, alkarylene, arylene, or any combination thereof either with or without connecting groups such as oxy, thio, carbonyl, sulfinyl, and sulfonyl; and Y is a monovalent radical selected from the group consisting of alkyl, cycloalkyl, aralkyl, alkaryl, and aryl.

3,712,920

2,5-THIOPHENEDIYL-BIS(IODONIUM SALTS)

Zdravko Jezic, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 31, 1968, Ser. No. 733,234
Int. Cl. A61k *27/00;* **C07d** *63/14*
U.S. Cl. 260—332.5 **8 Claims**

The novel compounds (I-phenyl)-I'-phenyl-I,I'-(2,5-thiophenediyl)-bis(iodonium salts) are prepared by condensing a phenyl-2-thienyliodonium trifluoroacetate with a (diacetoxyiodo)benzene in the presence of sulfuric acid. The compounds are useful as antimicrobials for the inhibition of the growth of many bacterial and fungal organisms.

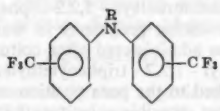
3,712,921

α,α,α,α',α',α'-HEXAFLUORODI-m-TOLYLAMINE DERIVATIVES

Harry L. Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Sept. 10, 1970, Ser. No. 71,234
Int. Cl. C07c *87/16, 87/18*
U.S. Cl. 260—570.5 P **5 Claims**

α,α,α,α',α',α'-Hexafluorodi - m - tolylamine derivatives are provided having the structure



wherein R is as defined hereinafter. These compounds are useful as antibacterial agents and in the treatment of hypertension.

3,712,922

UNSATURATED QUATERNARY ALKYLATED FATTY ACIDS AND DERIVATIVES

Clive A. Henrick and John B. Siddall, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Sept. 28, 1970, Ser. No. 76,280
Int. Cl. C07c *69/52;* **A01n** *9/24*
U.S. Cl. 260—410.9 R **13 Claims**

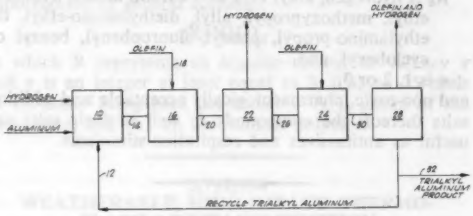
Aliphatic quaternary alkyl compounds having unsaturation at C-2,3, C-4,5 and/or C-8,9 and intermediates therefor useful as insect control agents, lubricants, plasticizers and odorants.

3,712,923

PROCESS FOR THE PRODUCTION OF TRIALKYL ALUMINUM COMPOUNDS

Kaye L. Motz and John Friend, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Jan. 18, 1971, Ser. No. 107,205
Int. Cl. C07f *5/06*
U.S. Cl. 260—448 A **11 Claims**



The present invention relates to an improved process for the production of trialkyl aluminum compounds using aluminum, hydrogen and olefinic materials as the reactants. By the present invention, a process is provided which minimizes the loss of aluminum due to the decomposition of the intermediate formed in the process, dialkyl aluminum hydride, resulting in improved yields of the end product, trialkyl aluminum. A trialkyl aluminum compound is reacted with aluminum metal and hydrogen at an elevated pressure to form an intermediate dialkyl aluminum hydride reaction product. The intermediate reaction product is reacted with an olefinic material at the elevated pressure so that a quantity of trialkyl aluminum is formed sufficient to reduce the concentration of the dialkyl aluminum hydride intermediate to a level equal to or slightly below the equilibrium concentration thereof that would exist at a reduced pressure. The pressure on the intermediate reaction product is then lowered to said reduced pressure and the intermediate reaction product is reacted with additional olefinic material to complete the formation of the trialkyl aluminum product.

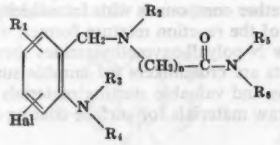
3,712,924

HALO-SUBSTITUTED 2-AMINO-BENZYLAMINE-AMIDES AND SALTS THEREOF

Gerd Kruger, Biberach an der Riss, Otmar Zipp, Osnabruck, and Johannes Keck, Josef Nickl, Hans Machleidt, Gerhard Ohnacker, Robert Engelhorn, and Sigfrid Puschmann, Biberach an der Riss, Germany, assignors to Boenringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

No Drawing. Continuation-in-part of application Ser. No. 872,778, Oct. 30, 1969, which is a continuation-in-part of application Ser. No. 555,696, June 7, 1966, both now abandoned. This application Nov. 12, 1970, Ser. No. 89,058
Claims priority, application Germany, June 8, 1965, T 28,754
Int. Cl. C07c *103/30*
U.S. Cl. 260—558 A **7 Claims**

Compounds of the formula



wherein

Hal is chlorine or bromine,

R_1 is hydrogen, chlorine or bromine,

R_2 is alkyl of 1 to 4 carbon atoms, allyl, phenyl, chlorophenyl, methoxyphenyl, carboxyphenyl, carbomethoxy-phenyl, tolyl, benzyl, methoxy-propyl, cyclohexyl, phenethyl or dimethylamino-propyl,

R_3 and R_4 are each hydrogen, acetyl or benzoyl,

R_5 is hydrogen, alkyl of 1 to 3 carbon atoms or cyclohexyl,

R_6 is hydrogen, alkyl of 1 to 3 carbon atoms, hydroxyethyl, methoxypropyl, allyl, diethylamino-ethyl, diethylamino-propyl, phenyl, fluorophenyl, benzyl or cyclohexyl, and

n is 1, 2 or 3,

and non-toxic, pharmacologically acceptable acid addition salts thereof; the compounds as well as their salts are useful as antitussives and respiration-stimulants.

3,712,925

ACENAPHTHENE DERIVATIVES

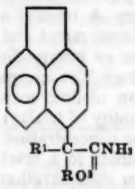
Seymour D. Levine, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Dec. 23, 1970, Ser. No. 101,161

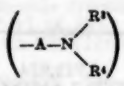
Int. Cl. C07c *103/30*

U.S. Cl. 260—558 A **4 Claims**

Acenaphthene derivatives are provided having the general structure



wherein at least one of R^1 and R^2 is alkyl or substituted aminoalkyl



and the other can be hydrogen, wherein R^3 and R^4 are hydrogen or a hydrocarbon radical, and A is alkylene. These compounds possess anti-inflammatory activity.

3,712,926

PRODUCTION OF N-POLYALKOXYMETHYL-AMIDES

Harro Petersen, Frankenthal, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,494

Int. Cl. C07c *103/30*

U.S. Cl. 260—561 K **1 Claim**

The production of N-polyalkoxymethylamides by reaction of carboxamides or their N-methylol compounds or N-methylol ether compounds with formaldehyde followed by reaction of the reaction mixture formed with alkanols, and the new N-polyalkoxymethylamides themselves. The new products are crosslinkers for curable surface coating compositions and valuable starting materials for the production of raw materials for surface coating compositions and plastics.

3,712,927

ALKANOLAMINE DERIVATIVES

Ralph Howe and Leslie Harold Smith, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Sept. 19, 1968, Ser. No. 760,999

Claims priority, application Great Britain, Sept. 27, 1967, 43,927/67

Int. Cl. C07c *101/44, 103/38*

U.S. Cl. 260—471 C **2 Claims**

The disclosure relates to 1-(4-acylamino-2-substituted-phenoxy)-3-amino-2-propanol derivatives, processes for their manufacture, pharmaceutical compositions containing them and a method of using them to produce cardiac β-adrenergic blockade in warm-blooded animals. Representative of the compounds disclosed is 1-(2-bromo-4-propionamidophenoxy)-3-t-butylamino-2-propanol.

3,712,928

PHENYLCYCLOHEXANE DERIVATIVES AND METHODS FOR THEIR MANUFACTURE

Massimo Carissimi and Franco Ravenna, Milan, Italy, assignors to Maggioni & C. S.p.A., Milan, Italy

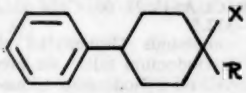
No Drawing. Filed Dec. 9, 1970, Ser. No. 96,596

Claims priority, application Italy, Dec. 13, 1969, 25,739/69

Int. Cl. C07c *49/76, 49/82*

U.S. Cl. 260—592 **7 Claims**

Novel derivatives of phenylcyclohexane, corresponding to the general formula



wherein X is either $—COCH_2OH$ or $—COCH_3$ and R is either a hydrogen or a hydroxyl, are disclosed. These novel compounds exhibit considerable anti-inflammatory and progestinic activities. Several methods for the preparation of the subject phenylcyclohexane derivatives are indicated, inasmuch as no general method exists for their preparation.

3,712,929

1-PERFLUOROALKYL-1,2,2-TRIPHENYL-ETHYLENES

William J. Middleton, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 31, 1969, Ser. No. 873,078

Int. Cl. C07c *43/20*

U.S. Cl. 260—612 R **6 Claims**

Certain 1 - perfluoroalkyl - 1,2,2-triphenylethylenes are effective in preventing pregnancy in warm-blooded animals and can be administered after coitus. The preferred 1 - perfluoroalkyl - 1,2,2 - triphenylethylenes have an oxygen atom attached to the para position of at least one of the benzene rings, possible substituents including the hydroxyl, an alkoxy group, and an acyloxy group. The benzene ring in the 1-position of 1-perfluoroalkyl-1,2,2-triphenylethylene can have one or more halogen or lower perfluoroalkyl substituents.

3,712,930

PROCESS FOR POLYMERIZATION OF TETRAHYDROFURAN

Kazuo Matsuda, Yakayama, Yoshiaki Tanaka, Osaka, and Takeyo Sakai and Ichiro Iwasa, Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

No Drawing. Filed Feb. 24, 1970, Ser. No. 13,839

Claims priority, application Japan, Mar. 3, 1969, 44/15,932

Int. Cl. C07c *41/00, 43/02*

U.S. Cl. 260—615 B **6 Claims**

Tetrahydrofuran is polymerized in the presence of a catalyst of fuming sulfuric acid containing from 15–43

wt. percent of SO_3. The amount of the catalyst is in the range of 10–40 parts by weight of catalyst per 100 parts by weight of tetrahydrofuran. The polymerization temperature is in the range of from −40° C. to about +100° C.

3,712,931

CHLOROFLUORINATION OF OLEFINS

J. Warren Hamersma, Tustin, and Frederick F. Caserio, Jr., Laguna Beach, Calif., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed July 23, 1969, Ser. No. 844,118
Int. Cl. C07c *17/02, 19/08*
U.S. Cl. 260—653.7 13 Claims

Ethylene and homologous olefins are reacted with chlorine in the presence of anhydrous HF, which may contain from 0.1 to 4 M./l. fluoride ion to produce chlorofluoroparaffins, e.g., C_2H_4ClF, which are useful as intermediates in the preparation of monomers. Fluoride ion concentration, achieved by the addition of metal fluoride salts, and temperature-pressure interrelationships permit substantially increased selectivity to the chlorofluoro product and improved yield. Pressures from about 2 to 10 atmospheres are preferred with temperatures near the boiling point of HF at reaction pressure.

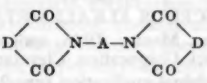
3,712,932

POLYSULPHONE COMPOSITIONS

Maurice Balme, Saint-foy-les-Lyon, and Max Gruffaz, La Mulatiere, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Aug. 18, 1971, Ser. No. 172,939
Claims priority, application France, Aug. 21, 1970, 7030755
Int. Cl. C98g *41/04*
U.S. Cl. 260—857 PI 16 Claims

A film-forming composition having good heat stability which comprises (a) a polysulphone and (b) an imide prepolymer obtained by reacting an N,N′-bis-imide of an unsaturated dicarboxylic acid of general formula:



(I)

in which D represents a divalent organic radical containing a carbon-carbon double bond and A represents a divalent organic radical possessing at least two carbon atoms, with a di-primary diamine of general formula:

$$H_2N—B—NH_2$$

in which B represents a divalent organic radical possessing not more than 30 carbon atoms, the quantities of bis-imide and of diamine being such that the ratio

$$\frac{\text{number of mols of N,N′-bis-imide}}{\text{number of mols of diamine}}$$

is between 1.1 and 50.

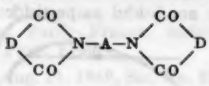
3,712,933

POLYIMIDE COMPOSITIONS

Maurice Docloux, Irigny and Max Gruffaz, La Mulatiere, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Aug. 24, 1971, Ser. No. 174,551
Claims priority, application France, Aug. 27, 1970, 7031362; June 24, 1971, 23,068
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 PI 18 Claims

A thermosetting composition having remarkable heat resistance which comprises (a) an imide prepolymer obtained by reacting an N,N′-bis-imide of an unsaturated dicarboxylic acid of general formula:



in which D represents a divalent organic radical containing a carbon-carbon double bond and A is a divalent organic radical possessing at least two carbon atoms, with a polyamine of general formula:

$$R(NH_2)_x$$

in which R represents an organic radical of valency x and x is an integer at least equal to 2, 0.55 to 25 mols of bis-imide being used per molar —NH_2 group of the polyamine, and (b) an unsaturated polyester.

3,712,934

WEATHERABLE, HIGH IMPACT, THERMOPLASTIC RESIN COMPOSITION

Hiroshi Kiuchi and Yoshio Takezawa, Otsu-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 5, 1969, Ser. No. 882,468
Claims priority, application Japan, Dec. 6, 1968, 43/88,974
Int. Cl. C08f *41/12, 29/56, 29/50*
U.S. Cl. 260—876 R 6 Claims

A thermoplastic resin composition essentially of (I) high impact-resistance resin (A) obtained from graft polymerizing the mixture consisting essentially of (a) 98–40% by weight monomer or monomer mixture containing at least 70% by weight of monomer or monomer mixture selected from the group consisting of vinyl aromatic, methacrylic acid alkyl ester wherein the alkyl group contains 1–3 carbon atoms, and acrylonitrile and less than 30% by weight of other vinyl monomer, wherein, in such monomer or monomer mixture the sum of 3.5 times the percent by weight of acrylonitrile plus the percent by weight of said methacrylic acid alkyl ester is within the range of 25–150% by weight of the monomer or monomer mixture, (b) from 2–60% by weight rubbery graft activated copolymer of ethylene and vinyl acetate, wherein the ethylene content is from 60–95% by weight, and (II) high impact-resistance resin (B) obtained from (c) graft polymerizing the mixture of about more than 4% by weight, preferably less than 70% by weight, polybutadiene series rubber and about less than 96% by weight, preferably more than 30% by weight said monomer or monomer mixture (a), or (d) blending said polybutadiene series rubber with the resin obtained from polymerizing said monomer or monomer mixture (a).

With the thermoplastic resin composition thus obtained, polybutadiene series rubber should be within the range of 2–70% by weight of total rubber content.

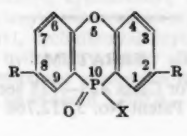
3,712,935

PHENOXAPHOSPHINIC ACID DERIVATIVES

Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Oct. 3, 1968, Ser. No. 764,913, now Patent No. 3,576,863, dated Apr. 27, 1971. Divided and this application May 25, 1970, Ser. No. 48,694
Int. Cl. C07d *105/04*
U.S. Cl. 260—936 3 Claims

Phenoxaphosphinic acid derivatives corresponding to the formula



wherein R represents chloro, bromo, lower alkyl or lower alkoxy and X represents lower alkoxy, or phenylthio. The compounds are useful as pesticides for the control of plant pests.

3,712,936

ALKYL CARBAMOYL-N,N-DIALKYL-PHOSPHONAMIDATES

Arthur G. Jelinek, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 8, 1970, Ser. No. 79,252

Int. Cl. C07f *9/24;* **A01n** *9/36*

U.S. Cl. 260—943 **3 Claims**

The disclosure teaches the preparation of a novel group of alkyl carbamoyl-N,N-dialkylphosphonamidates which are useful to retard the growth of plants or to increase the sugar content of sugar-containing plants.

The alkyl carbamoyl-N,N-dialkylphosphonamidates are prepared as follows:

An appropriate amine is reacted with a dialkylchlorophosphite. The product is treated with a suitable chloroformate followed by treatment with ammonia.

3,712,937

S-(1,3 - DIHALO-PROP-2-YL-MERCAPTOMETHYL)-THIOL AND THIONOTHIOL PHOSPHORIC AND PHOSPHONIC ACID ESTERS

Gerhard Schrader, Wuppertal-Cronenberg, and Ingeborg Hammann, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 2, 1970, Ser. No. 7,984

Claims priority, application Germany, Feb. 10, 1969, P 19 06 490.5

Int. Cl. C07f *9/16, 9/40;* **A01n** *9/36*

U.S. Cl. 260—948 **10 Claims**

S-(1,3-dihalo-prop-2-yl-mercaptomethyl)-thiol and thionothiol phosphoric and phoshonic acid esters, i.e. (alkyl and O - alkyl)-O-alkyl-S-(1,3-dihalo-prop-2-yl-mercaptomethyl)-thiol and thionothiol phosphoric and phosphonic acid esters, which possess arthropodicidal, especially acaricidal and insecticidal, properties as well as selective rodenticidal properties.

3,712,938

β-PHENYLETHYL ESTERS OF ALKYL-O-PHENYLTHIOPHOSPHONIC ACIDS

Gerhard Schrader, Wuppertal-Cronenberg, Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal-Vohwinkel, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 31, 1970, Ser. No. 24,398

Claims priority, application Germany, Apr. 2, 1969, P 19 16 840.2

Int. Cl. C07f *9/40;* **A01n** *9/36*

U.S. Cl. 260—949 **8 Claims**

β-Phenylethyl esters of alkyl-O-phenylthiolphosphonic acids which possess insecticidal and acaricidal properties and process for their production.

ERRATUM

For Class 423—328 see:
Patent No. 3,712,768

3,712,939

METHOD FOR RECOVERING TANTALUM AND/OR COLUMBIUM

Raymond H. Capps and Gordon S. Harman, Marietta, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 29, 1971, Ser. No. 128,706

Int. Cl. C22b *59/00*

U.S. Cl. 423—63 **1 Claim**

Method for recovering tantalum and/or columbium values from insoluble residues obtained from the acid leaching of columbium and/or tantalum containing ore by acid treating the residues and contacting the resulting slurry with methyl-isobutyl ketone.

3,712,940

METHOD FOR ELIMINATING DUMPING OF WASTE PICKLE LIQUOR AND CONVERSION THEREOF INTO USEFUL PRODUCTS

Harry Silby, Miami, Fla., Maymie Silby and Joseph H. Krause, executors of the estate of Harry Silby, deceased, assignors to Wire Sales Company

Continuation-in-part of abandoned application Ser. No. 752,802, Aug. 15, 1968. This application Nov. 24, 1970, Ser. No. 92,452

Int. Cl. C01g *49/02;* **C02b** *1/26*

U.S. Cl. 423—140 **11 Claims**

Pollution of rivers, lakes and streams caused by the dumping of waste pickle liquor, can be completely eliminated by a process including the steps of crystallization, to recover and recycle most of the spent acid, contacting the filtrate with NaOCl, separation of precipitate followed by drying to obtain ferric oxide which is a commercially useful product. The filtrate obtained after treatment with NaOCl contains the corresponding sodium salt, depending upon the composition of the waste pickle liquor, which can be recovered as a further useful product.

3,712,941

HIGHLY SILICEOUS ALKALI METAL SILICATES

Clyde B. Myers, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Original application June 21, 1968, Ser. No. 738,771. Divided and this application Dec. 21, 1970, Ser. No. 100,445

Int. Cl. C01b *33/32*

U.S. Cl. 423—332 **2 Claims**

A process is described whereby alkali metal silicates having silica:alkali metal oxide weight ratios of at least 4.0:1 are provided by mixing an aqueous alkali metal silicate with an amorphous silica and reacting the resultant mixture at a temperature between about room temperature and at least the temperature at which intumescence occurs. By this method high ratio alkali metal silicates of varying degrees of plasticity and water solubility may be obtained.

3,712,942

METHOD OF PRODUCING VANADIUM COMPOUNDS BY ALKALINE LEACHING

Zdeněk Švejda, Prague, Czechoslovakia, assignor to Vyzkumny ustav Kovu, Panenske Brezany, Czechoslovakia

No Drawing. Filed May 29, 1968, Ser. No. 732,834

Int. Cl. C10g *31/00;* **C22b** *3/00, 55/00*

U.S. Cl. 423—593 **5 Claims**

Vanadium compounds are produced from ores by adding sodium hydroxide or potassium hydroxide to finely

ground raw material which contains V_2O_3 or another insoluble form of vanadium, the concentration of the sodium hydroxide or potassium hydroxide being in the range of 250 to 400 g./l. Na_2O or K_2O, wherein the reaction mixture is heated to a temperature of at least 250° and oxygen or compressed air is added to oxidize the V_2O_3 to V_2O_5, and then filtering the solution so as to separate the crystalline alkaline vanadate formed. In addition, prior to the crystallization soluble fluorides or phosphates may be added to the solution so as to further increase the crystallization.

3,712,943

INSECTICIDALLY, ACARICIDALLY AND RODENTICIDALLY ACTIVE 9-SUBSTITUTED ACRIDINES

Dietmar Mayer, Leverkusen, Klaus Sasse, Schildgen, and Gunther Hermann, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 24, 1969, Ser. No. 879,611

Claims priority, application Germany, Nov. 28, 1968, P 18 11 409.5

Int. Cl. A01n *17/14, 9/22*

U.S. Cl. 424—84 **8 Claims**

Compositions and methods of using certain 9-substituted-acridines, i.e., 1,2,3 and 4-(optionally alkyl and chloro)-9-[1′-(optionally alkyl and hydroxy-alkyl)-2′-mono- and 2′,2′-di(optionally alkyl, chloroalkyl, alkylcarbonyl, cyanoalkyl-carbonyl, phenyl-alkyl-carbonyl, phenoxy-alkyl-carbonyl, cycloalkyl-carbonyl, alkoxy-carbonyl, phenyl-carbonyl, chlorophenyl-carbonyl, alkylphenyl-carbonyl, alkoxy-phenyl-carbonyl, nitro-phenyl-carbonyl, furyl-carbonyl, pyridyl-carbonyl and alkylphenyl-sulfonyl) as well as 2′-(alkylidene and phenylalkylidene)-hydrazino]-acridines; 1,2,3 and 4-(optionally alkyl and chloro)-9-[N-(optionally alkyl and hydroxyalkyl)-N-(piperidino and morpholino)-amino]-acridines; 1,2,3 and 4-(optionally alkyl and chloro)-9-[3′-(optionally alkyl and hydroxy-alkyl)-4′-mono- and 4′,4′-di-(optionally alkyl, chloroalkyl, alkyl-carbonyl, cyanoalkyl-carbonyl, phenyl-alkyl-carbonyl, phenoxy-alkyl-carbonyl, cycloalkyl-carbonyl, alkoxy-carbonyl, phenyl-carbonyl, chloro-phenyl-carbonyl, alkyl-phenyl-carbonyl, alkoxy-phenyl-carbonyl, nitro-phenyl-carbonyl, furyl-carbonyl, pyridyl-carbonyl and alkyl-phenyl-sulfonyl) as well as 4′-(alkylidene and phenyl-alkylidene)-thiosemi carbazido]-acridines; 1,2,3 and 4-(optionally alkyl and chloro)-9-[3′-(optionally alkyl and hydroxy-alkyl)-3′-(piperidino and morpholino)-thioureido]-acridines; and the corresponding hydrogen chloride and alkyl-sulfuric acid salts; some of which are known, which possess strong insecticidal, acaricidal and rodenticidal properties.

3,712,944

STEMLON AND ITS PRODUCTION

Martin Cole, Dorking, Surrey, and Donald N. Planterose, Guildford, Surrey, England, assignors to Beecham Group Limited, Brentford, Middlesex, England

No Drawing. Filed Jan. 2, 1969, Ser. No. 788,618

Claims priority, application Great Britain, Jan. 6, 1968, 968/68

Int. Cl. A61k *21/00*

U.S. Cl. 424—115 **2 Claims**

Stemlon, a substance which inhibits encephalomyocarditis virus, Semlike forest virus and coxsackie virus in mice and its production from *Stemphylium botryosum*. ATCC No. 20183 is described.

3,712,945

ANTIBIOTIC 18,887 R.P.

Denise Mancy, Charenton, and Leon Ninet and Jean Preud'Homme, Paris, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Aug. 21, 1969, Ser. No. 851,902

Claims priority, application France, Aug. 23, 1968, 163,994

Int. Cl. A61k *21/00*

U.S. Cl. 424—118 **10 Claims**

A new acid antibiotic designated 18,887 R.P., which has the elementary composition C=54.3–54.7%, H=7.2–7.5%, N=12.35–12.45% and O=23.4%, and is a white powder melting at 215° C., insoluble in hexane, sparingly soluble in ethyl acetate and in water, and easily soluble in aqueous butanol, is prepared by aerobically cultivating the new microorganism *Streptomyces caelicus*, strain DS 10,579 (NRRL 3506), or a 18,887 R.P.-producing mutant thereof, using an aqueous nutrient medium. The antibiotic and non-toxic salts thereof possess high antibacterial activity against gram-positive microorganisms, except mycobacteria.

3,712,946

CERTAIN OXY-SUBSTITUTED BENZO QUINOLIZINIUM COMPOUNDS AND THEIR USE

Karl J. Doebel and Jeffrey W. H. Watthey, Ossining, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Original application Sept. 11, 1969, Ser. No. 857,658, now Patent No. 3,565,899. Divided and this application Feb. 19, 1971, Ser. No. 117,148

Int. Cl. A61k *27/00*

U.S. Cl. 424—258 **3 Claims**

(1) Benzo[b]quinolizinium compounds disubstituted in the 8,9- and 9,10-positions and trisubstituted in the 8,9,10-positions with hydroxy, lower alkanoxy and lower alkanoyloxy groups, and (2) lower alkyl and 11-amino substituted derivatives thereof are useful as cardiovascular agents, as agents affecting the central nervous system, and as antipyretic agents.

3,712,947

COMPOSITIONS CONTAINING COUMARIN ETHER SUN-SCREENING COMPOUNDS

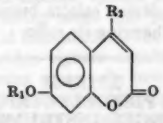
Ernst Theodore Theimer, Rumson, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Original application Dec. 9, 1969, Ser. No. 883,239, now Patent No. 3,625,976. Divided and this application July 22, 1971, Ser. No. 165,343

Int. Cl. A61k *9/06;* **A61l** *23/00*

U.S. Cl. 424—59 **3 Claims**

Sun-screening compositions containing essentially colorless, stable, odorless, non-irritating, non-sensitizing, and oil-compatible coumarin ether compounds, such compounds having the formula:



wherein R_1 is alkenyl, cycloalkenyl, alkadienyl, cycloalkadienyl, alkatrienyl, alkoxyalkadienyl, acyloxyalkadienyl, alkoxyalkenyl, cyclialkoxyalkenyl, aryl, alkaryl, or aralkyl and R_2 is hydrogen or lower alkyl and such compounds having ultraviolet absorption maxima within the range of 2,900 A. up to about 3,400 A.

3,712,948

ANTIPERSPIRANT ACTION BY BIMETALLIC SALTS OF GLUCONIC, GLUCURONIC AND GALACTURONIC ACIDS

Alfred Halpern, Great Neck, and Ernest J. Sasmor, Yonkers, N.Y., assignors to Synergistics, Inc., New York, N.Y.

No Drawing. Application Sept. 25, 1967, Ser. No. 674,051, now Patent No. 3,501,575, dated Mar. 17, 1970, which is a continuation of application Ser. No. 339,443, Jan. 22, 1964, now Patent No. 3,361,769. Divided and this application July 7, 1969, Ser. No. 872,784

Int. Cl. A61k *7/00*

U.S. Cl. 424—68 8 Claims

A method of producing an antiperspirant action in an animal by applying to the skin thereof a composition comprising a compound of the formula XAlOH2R is disclosed. In the said formula X may be magnesium or calcium, and R is either the gluconic, glucuronic or galacturonic acid radical.

3,712,949

INJECTABLE OXYTETRACYCLINE COMPOSITIONS

Sheldon B. Greenbaum, Livingston, and Kurt H. Schaaf, Morris Plains, N.J., and Howard C. Klein, Brooklyn, N.Y., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 807,121, Mar. 13, 1969. This application Feb. 4, 1970, Ser. No. 8,747

Int. Cl. A61k *21/00*

U.S. Cl. 424—227 7 Claims

Injectable oxytetracycline compositions are prepared using glycerol formal as the solvent. The compositions have low viscosities at low temperatures and in addition have excellent stability of color, potency and clarity.

ELECTRICAL

3,712,950

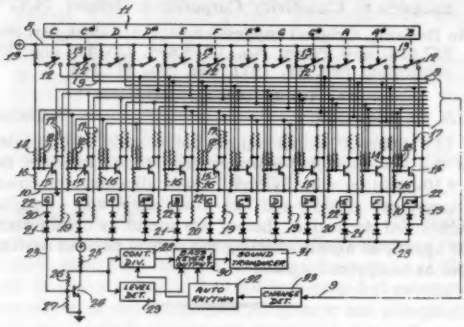
AUTOMATIC BASS FROM CHORD APPARATUS

Alfred B. Freeman, 20418 Seaboard Road, Malibu, Calif. 90265

Filed Dec. 14, 1970, Ser. No. 97,921

Int. Cl. G10h *1/00*

U.S. Cl. 84—1.03 19 Claims



An apparatus for automatically playing bass parts to accompany manually held chords which has an automatic rhythm device controlling a special bass divider between dividing ratios of three and two or four to produce bass outputs in root and fourth relation to its input which is received from keyers driven by logic devices sensing the playing keys operated to pass a signal corresponding to the chord fifth. The net result is that the divider output is the root and fifth of the chord. The logic ranges from a simple interlock switching for the lowest playing to key to one requiring root and minor or major third playing keys operated and augmented fifth and sixth part playing keys not operated. The new logic means can alternatively drive two keyers to different busses and the automatic rhythm device selects busses for input to the divider instead of changing its ratio.

3,712,951

BRIDGE TYPE PIEZOELECTRIC PICKUP FOR STRINGED INSTRUMENTS

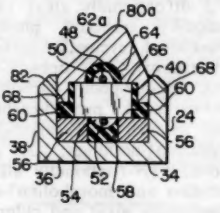
James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.

Filed Dec. 6, 1971, Ser. No. 205,069

Int. Cl. G10h *3/00*

U.S. Cl. 84—1.14 18 Claims

A bridge type piezoelectric pickup for a guitar or similar stringed instrument comprises a plurality of piezoelectric elements, one for each string, located within an open topped case. Overlying each of these piezoelectric elements is a respective one of a plurality of saddle members which is restrained to vertical sliding movement relative to the case, each saddle member engaging and supporting its associated string and transmitting vibrations from the string to its associated piezoelectric element. The piezoelectric elements have top and bottom output faces including metallic coatings. Output signals are extracted from the elements by means of conductors soldered to the metallic coatings to form sound mechanical and electrical connections between the conductors and the elements.



3,712,952

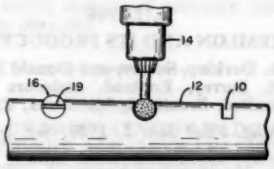
FRET BOARD FOR STRINGED INSTRUMENTS

Donald J. Terlinde, 731 Charles St., St. Paul, Minn. 55101

Filed May 4, 1971, Ser. No. 140,096

Int. Cl. G10d *3/06*

U.S. Cl. 84—314 7 Claims



A fret board for a stringed musical instrument in which frets are formed by sliding circular cross section metal or plastic members into circular cross section grooves in the surface of the fret board. When worn the frets are easily replaceable without damage to the fret board. Also the plastic fret members may have conducting metal

portions molded therein to provide contacts for organ type circuits.

3,712,953

CONDUCTOR ARRANGEMENT FOR METAL CLAD ELECTRIC DISTRIBUTING AND/OR SWITCHING PLANTS FOR HIGH VOLTAGE

Rintje Boersma, Harmelen, and Gijsbert Waldemar Irik, Bilthoven, Netherlands, assignors to N.V. "COQ," Utrecht, Netherlands

Filed Sept. 3, 1970, Ser. No. 69,311
Claims priority, application Netherlands, Jan. 30, 1970, 7001325
Int. Cl. H02g *5/06*
U.S. Cl. 174—99 B 11 Claims

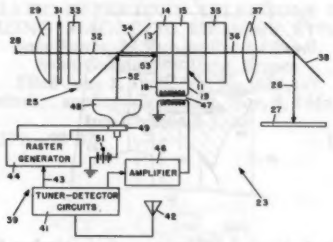
Bar-like electric conductor surrounded by an earthed metal envelope for metal clad electric distributing and/or switching plants, said bar-like conductor having the shape of a number of bar-shaped elements which are interconnected by thin webs and being supported in said envelope by insulators extending between the enevolepe and a portion of the conductor lying between two bar-shaped elements thereof.

3,712,954

LARGE SCREEN TELEVISION SYSTEMS

Donald S. Oliver, Acton, and Jerrold R. Zacharias, Belmont, Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Apr. 7, 1971, Ser. No. 132,020
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 BD 27 Claims



Disclosed are display systems for producing large, high intensity images in either black and white or color. High intensity beams of polarized light scan a display screen and are amplitude modulated by valves comprising electro-optical/photoconductive elements.

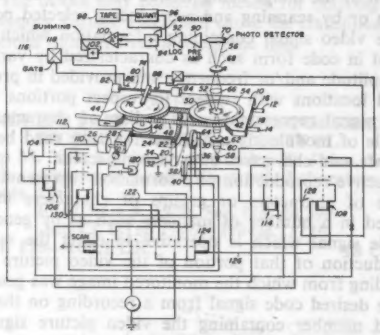
3,712,955

METHOD AND APPARATUS FOR OPTICALLY SCANNING SPECIMENS AND PRODUCING GRAPHIC RECORDS THEREFROM

Carlton S. Miller, Lexington, Mass., assignor to PhotoMetrics, Inc., Lexington, Mass.

Filed Jan. 6, 1971, Ser. No. 104,394
Int. Cl. G01n *21/06, 21/22;* H04n *1/24*
U.S. Cl. 178—6.6 R 18 Claims

A specimen, such as a photographically recorded image, microscope slide or the like, is spirally scanned by a high speed scanning optical microscope which produces in real time on a recording table a spirally formed record wherein the density, transmission, fluorescence or similar characteristics of the specimen are measured and presented in graphic form. A high resolution facsimile



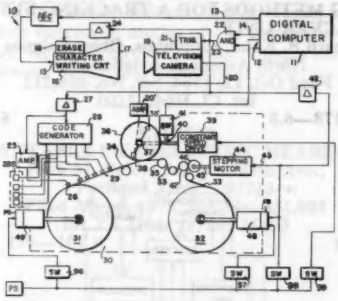
recording system is employed for producing a hard copy image which may be manipulated for quantization, contrast shaping and control, edge enhancement, noise suppression or the like. A wide range of magnifications is possible by the availability of differential movement rates between the specimen and the writeout.

3,712,956

INFORMATION SYSTEM

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of applications Ser. No. 225,173, Aug. 27, 1962 and Ser. No. 267,377, Mar. 11, 1963. This application Feb. 24, 1971, Ser. No. 118,424
Int. Cl. G11b *15/00, 27/32;* H04n *1/28*
U.S. Cl. 178—6.6 A 12 Claims

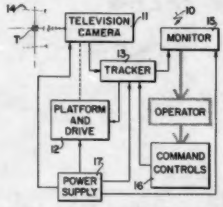


An information storage system for storing document information, retrieving same and performing operations with respect to said information. The information is stored in the form of video signals capable of generating still images on a viewing screen. In one form, the image information is generated as a plurality of lines of alphanumeric characters such as generated by a computer or by means of reproduced video picture signals stored on magnetic tape and selectively reproduced to generate visual images of typewritten lists of words such as catalog information, descriptions of data, formulas, etc. Upon visually monitoring said information, the persons reading same is provided with and activates manual control

means for generating electrical signals representative of a selected of said lines of characters, part of a line or a plurality of lines which signals may be in code or video form capable of being used by a computer. The code signals may be generated by operating on the portion of the video signal reproduced in scanning the selected portion of the image being viewed on a cathode ray tube screen or by scanning and reproducing selected portions of the video signal containing information which is recorded in code form such as characterized by variations in amplitude and/or frequency and provided in predetermined locations with respect to respect portions of the video signal representative of a line of characters and capable of modulating a cathode ray tube read beam to generate said characters on a viewing screen.

Selective reproduction of information representative of a line of characters or groups of characters may be effected in a number of manners such as by generating a code signal which is operative to effect the selective reproduction of that portion of the video picture signal recording from which the monitored image was generated or the desired code signal from a recording on the same record member containing the video picture signal recording used to generate the monitored image and the selected line of characters. Said selective reproduction of information representative of a selected line of characters viewed by the operator of the apparatus may also be effected by the operator's causing the read beam of the cathode ray tube being scanned or monitored to scan either the selected line of characters and logically operate on the video signal so generated to generate said code signals representative thereof or to scan coded information generated as spots or variations in color or grey scale along, above or below the selected line of characters to generate said code signals. In yet another form, a manually guided or otherwise directed photooptical means such as a photocell or light pen is employed to scan the line of characters or visual code information associated with said line to generate the desired code information as electrical signals which may be used by a computer.

3,712,957
APPARATUS AND INFORMATION PROCESSING METHODS FOR A TRACKING SYSTEM TRACKER UNIT
Richard B. Kuhn, Columbus, Ohio, assignor to North American Aviation, Inc.
Filed Oct. 12, 1964, Ser. No. 406,211
Int. Cl. H04n *3/00*
U.S. Cl. 178—6.8 **6 Claims**



1. In a tracking system tracker unit which develops electrical tracking error correction signals that control the viewing axis of a television camera sensor unit in tracking relation to a selected target and that are sourced in target marker pulses related to an opposed edge of the target through the television camera sensor unit output video signal and singularly positioned in each line of sensor unit scan in time-coincident relation with a tracking gate pulse to indicate required correction in one direction of two opposed directions, in combination:

(a) summing circuit means having a pair of input channels which each receive a different pulsed tracking error detection signal related to one of said two opposed directions and developing a tracking error correction signal which relates to said one direction and which is based on the singular existence of one different pulsed tracking error detection signal in a given line of sensor unit scan,

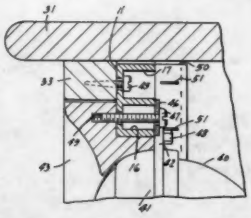
(b) means developing triggering pulses each of which commences with the start of a tracking gate pulse, each of which ends with a target marker pulse coincident with said tracking gate pulse, and each of which indicates tracking error detection associated with one of said two opposed directions,

(c) linearizing circuit means responsive to said triggering pulses and producing tracking error detection signal pulses which comprise said one different pulsed tracking error detection signal and which each essentially constitute an extension of one of said triggering pulses to a total individual time duration which is proportional to the individual duration of said triggering pulse, and

(d) separate circuit means conducting said tracking error detection signal pulses from said linearizing circuit means to one input channel of said summing circuit means,

said tracking error detection signal pulses each being proportional to the degree of tracking error detected in one of said two opposed directions and increasing the loop gain of the tracking system tracker unit and also of the tracking system.

3,712,958
PICTURE TUBE ESCUTCHEON MOUNTING MEMBER
Carlton F. Stute, Riverdale, Ill., assignor to Admiral Corporation, Chicago, Ill.
Filed Mar. 18, 1971, Ser. No. 125,613
Int. Cl. H04n *5/645, 5/65*
U.S. Cl. 178—7.8 **3 Claims**

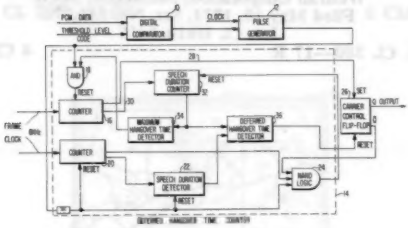


A molded plastic resilient mounting member for a television picture tube escutcheon is installed in framing relationship in the opening of a wood television cabinet. The member includes means for attachment to the cabinet and means for attaching a picture tube escutcheon thereto.

3,712,959
METHOD AND APPARATUS FOR DETECTING SPEECH SIGNALS IN THE PRESENCE OF NOISE
Ettore Fariello, Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.
Continuation-in-part of application Ser. No. 841,528, July 14, 1969. This application Mar. 13, 1970, Ser. No. 19,184
Int. Cl. H04b *15/00*
U.S. Cl. 179—1 VC **3 Claims**

A method and apparatus for detecting the instantaneous peak values of a PCM coded voice signal above a

threshold level and energizing a transmitter carrier in response thereto, thereby conserving carrier power during the periods when no voice signal is present. The threshold is established at a level where the probability of the instantaneous value of a speech signal exceeding its RMS value is much greater than the probability of the instantaneous value of a white Gaussian noise signal exceeding its RMS value for equal values of power. The circuit maintains carrier power for a variable delay or deferred hangover period after each thresholded voice detection. The



hangove period varies from a predetermined minimum time delay to a maximum time delay which equals the length of the voice burst not exceeding 150 milliseconds. Alternately, because of the particular characteristics of speech waveforms, the thresholded voice detections may be conveniently counted and the carrier transmitter energized whenever the count exceeds a predetermined value, which further reduces the margin of noise triggering error. In addition, the deferred, variable hangover period may be replaced by a fixed delay to futher simplify the circuitry required.

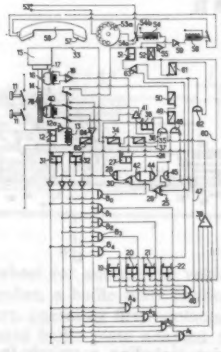
ERRATUM

For Class 179—6 see:
Patent No. 3,713,039

3,712,960
AUTOMATIC REPERTORY TELEPHONE DIALER UTILIZING MAGNETIC MEMORY STORAGE

Jean Baron, 25 Rue du Fer a Cheval, Saint-Germain-en-Laye, France

Filed June 2, 1969, Ser. No. 829,447
Claims priority, application France, Nov. 5, 1968, 172,627
Int. Cl. H04m *1/46*
U.S. Cl. 179—90 BB 13 Claims

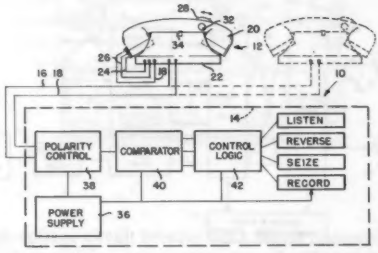


A magnetic memory for storing numbers or information, which may be in coded form. This memory is in the form of juxtaposed magnetic tracks on a magnetic drum, preferably having a small diameter and adapted to cooperate with at least one magnetic head in order to record said numbers or information in said memory, and a pulse-controlled step-by-step motor for driving said drum which turns through a predetermined angle in response to each pulse. The device may comprise means for deriving from said memory signals which will cause the transmission of a telephone number over a telephone line.

3,712,961
ENDLESS TAPE RECORDER-TRANSCRIBER DICTATION SYSTEM CONTROL

William M. Nye, Bellevue, and Stanley W. Jones, Seattle, Wash., assignors to Lonier Electronic Laboratory, Inc., Atlanta, Ga.

Filed June 8, 1970, Ser. No. 44,390
Int. Cl. G11b *19/00;* H04m *11/10*
U.S. Cl. 179—100.1 DR 18 Claims

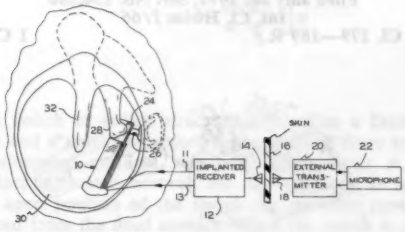


A remote dictation station is connected to a recorder-transcriber by two conductors which carry audio signals and control signals in the seize, dictate, reverse or listen modes between the dictation station and the recorder-transcriber. The polarity of the two conductors is reversed after receiving an initial signal from the dictation station that a user wishes to seize an available recorder-transcriber. A voltage comparator responsive to resistance changes in the dictate station initiator signals to operate the various functional modes of the recorder-transcriber. The seize signal from the voltage comparator is of a value between dictate and listen signal value.

3,712,962
IMPLANTABLE PIEZOELECTRIC HEARING AID

John M. Epley, 545 NE. 47th Ave., Portland, Oreg. 97213

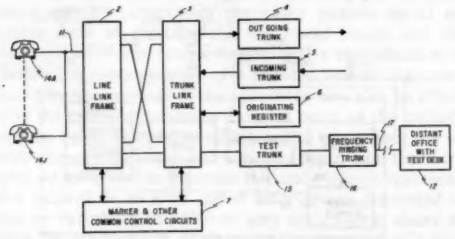
Filed Apr. 5, 1971, Ser. No. 131,005
Int. Cl. H04r *17/00, 25/00*
U.S. Cl. 179—107 R 17 Claims



An implantable hearing aid apparatus is described using a piezoelectric transducer device. One embodiment of the

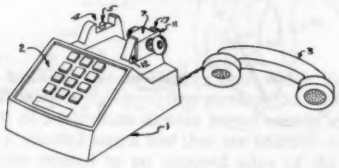
device is a bendable piezoelectric member which may be inserted between two bones in the ossicular chain of the middle ear for movement of such bones in accordance with an audio frequency electrical signal applied to such transducer. Another embodiment of the transducer member is a cylindrical piezoelectric member which elongates when a signal is applied thereto for movement of the ossicular bones. The transducer may also be used as a pick-up device to sense the mechanical movement of the ossicular bones and produce a corresponding electrical output signal which may be applied to the nerves of the inner ear.

3,712,963
FREQUENCY RINGING TEST TRUNK CIRCUIT
Amin Y. Zaky, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.
Filed Aug. 4, 1971, Ser. No. 168,919
Int. Cl. H04m *3/22*
U.S. Cl. 179—175.2 B **14 Claims**



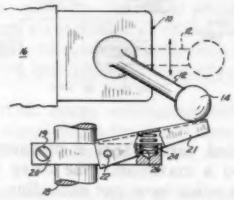
A frequency ringing test trunk circuit, when seized, detects frequency ringing signals received at one of the tip and ring lines from a test desk in a distant office, and transmits a frequency ringing signal corresponding to the received ringing signal via a local office to signal a called party line subscriber. The frequency ringing signal transmitted by the trunk circuit need not be the same as that received. When the called party answers, the trunk circuit stops ringing and signals to the test desk that the called party has answered. As many as ten party subscriber telephone sets can be connected to one telephone line and may be separately rung by the test desk at the distant central office. The frequency ringing trunk circuit also includes modifications in the trunk circuit for use with longer lines and also for inhibiting the trunk circuit during the silent periods between ringing bursts.

3,712,964
LOCK FOR TELEPHONE INSTRUMENT
Fred F. Richards, Sr., P.O. Box 47307, Dallas, Tex. 75247
Filed July 26, 1971, Ser. No. 154,500
Int. Cl. H04m *1/66*
U.S. Cl. 179—189 R **1 Claim**



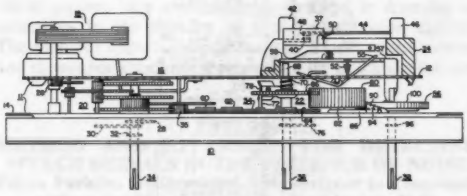
A lock mechanism includes a key-operated lock cylinder contained in a lock body designed to fit into a cradle on a telephone set, a hook-cam attached to the lock cylinder and rotatable with the lock cylinder to engage the telephone case structure in such a manner as to hold the lock body into the telephone cradle where the lock body will hold the switch pins down and keep the telephone electrically inactive.

3,712,965
SWITCH OPERATING MECHANISM FOR LIMIT SWITCHES
Thomas B. Dalton, Muskegon, Mich., assignor to Westran Corporation, Muskegon, Mich.
Filed May 10, 1971, Ser. No. 141,776
Int. Cl. H01h *3/16*
U.S. Cl. 200—17 R **4 Claims**



A mechanism for operating a drum switch which includes a switch actuator movable between a first and a second position. A limit arm is rigidly mounted and aligned with the actuator. A lever is pivotally mounted on the limit arm with a spring biasing means further mounted between the limit arm and the lever. The lever is placed into abutment with the switch actuator responsive to movement of the switch to provide a first engagement between the actuator and the lever to depress the biasing means and subsequently to move the actuator from its first to its second position by the lever responsive to the return of the biasing means to its initial condition.

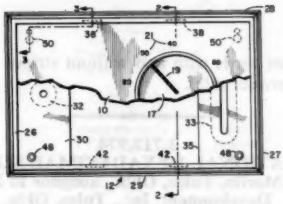
3,712,966
INTERVAL TIMING MECHANISM WITH IMPROVED CAM FOLLOWER FOR CAM OPERATED TIMERS
Norbert B. Watts and Walter P. Josam, Raleigh, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Aug. 19, 1971, Ser. No. 173,006
Int. Cl. H01h *43/10*
U.S. Cl. 200—38 R **7 Claims**



A timing device including a switch for automatically controlling the energizing time of an appliance. The timing device includes a rotor disc having a face which defines predetermined cam profiles, and a rocking lever

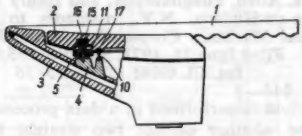
which cooperates with the cam profiles to actuate the switch. The rocking lever includes two integral cam followers, with one of the cam followers being constructed to return an associated timing indicator to zero at the termination of the energizing time.

3,712,967
ATMOSPHERIC CONDITION RESPONSIVE SWITCH AND HOUSING
Kenneth G. Carson, Newmarket, Ontario, Canada, assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sept. 13, 1971, Ser. No. 179,737
Int. Cl. H01h *35/42*
U.S. Cl. 200—61.06 6 Claims



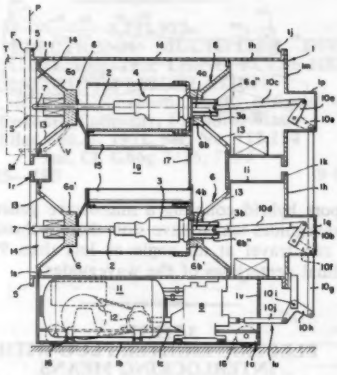
The control device disclosed has a decorative enclosure suitable for wall mounting. The face plate of the box-like enclosure is separable from the side walls but is recessed into the side walls so as to present the appearance of a unitary structure. The face plate is removable to give acess to the interior of the box to secure it to the wall of a room by using suitable fastening means and also to permit wiring the control device. The face plate carries the control device per se and the face plate can be mounted alone on the surface of a duct with the control device including a sensing means inside the duct.

3,712,968
VEHICLE-STEERING WHEEL WITH HORN-ACTUATING BAFFLE PLATE
Helmut Bonn and Konrad Randelzhofer, Aschaffenburg, Germany, assignors to Lenkradwerk Gustav Petri Aktiengesellschaft, Aschaffenburg, Germany
Filed Mar. 24, 1971, Ser. No. 127,646
Claims priority, application Germany, May 5, 1970, P 20 21 930.1
Int. Cl. H01h *9/00*
U.S. Cl. 200—61.56 6 Claims



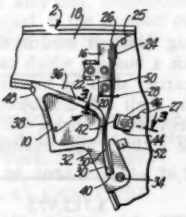
A steering wheel for automotive vehicles comprising a plurality of spokes, a baffle plate resiliently mounted on the spokes, horn operating first contacts mounted on the underside of said baffle plate adapted to engage second contacts mounted directly on the spokes, such that when said first and second contacts are mutually engaged, a signal is produced.

3,712,969
HIGH-VOLTAGE CIRCUIT BREAKER WITH GAS QUENCHING
Benito Jose Calvino y Teijeiro, Bergamo, Italy, assignor to Magrini Fabbriche Riunite Magrini Scarpa e Magnano M.S.M. S.p.A., Milan, Italy
Filed Mar. 22, 1971, Ser. No. 126,788
Claims priority, application Italy, Apr. 7, 1970, 22,980/70
Int. Cl. H01h *33/70*
U.S. Cl. 200—148 R 10 Claims



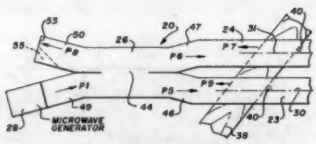
A high-voltage circuit breaker has a sealed unpartitioned metal tank containing one or more sets of self-blast breaking chambers or interrupters in an environment of sulfur hexafluoride (SF_6) at a pressure of 3–5 kg./cm.^{2}. The medium serves as the blast gas as well as the electrical insulation fluid for the various parts of the switches.

3,712,970
SINGLE SPRING SWITCH WITH WIPING ACTION
James S. Adie, Granada Hills, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed July 12, 1971, Ser. No. 161,691
Int. Cl. H01h *19/24*
U.S. Cl. 200—164 R 1 Claim



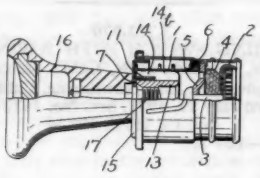
A switch or switch structure may utilize a fixed support and a movable support between which there extends an elongated, resilient, metal movable contact. A fixed contact is located between the two supports. In an initial open position of the switch the movable contact is spaced from the fixed contact. When the switch is closed the movable support is moved so as to apply pressure placing the movable contact under compression. This compression causes deflection of the movable contact so that the movable contact engages the fixed contact.

3,712,971
WAVEGUIDE APPARATUS FOR MICROWAVE DRYING OF MATERIALS
Lambertus Admiraal, Coquitlam, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada
Filed June 3, 1971, Ser. No. 149,546
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **7 Claims**



A 4-port hybrid coupling a microwave generator to a set of waveguides which have slots therein through which lumber can travel at an angle of less than 90° to the longitudinal centerlines of the waveguides.

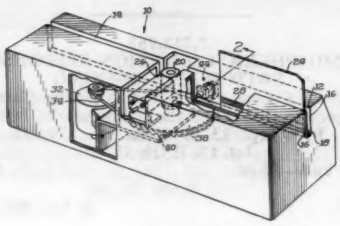
3,712,972
ELECTRIC LIGHTER PLUG WITH INTERLOCKING MEANS
Toshio Mase, Nagoya, and Tsukasa Kondo, Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishi-Kasugai-gun, Aichi-ken, Japan
Filed May 30, 1972, Ser. No. 257,934
Claims priority, application Japan, May 29, 1971, 46/44,485
Int. Cl. F23g *7/22*
U.S. Cl. 219—267 **2 Claims**



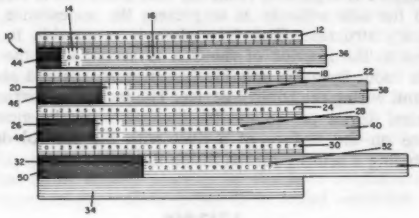
A lighter plug which is used in the socket of a cigar lighter, in which a bushing which carries a knob is firmly fitted to a carrier shell by means of interlocking lugs provided on the shell and a projection provided on the bushing, whereby the securing of the bushing to the carrier is made without any staking operation.

3,712,973
DUAL SPEED MACHINE HANDLING MAGNETICALLY STRIPED CARDS AND CARDS THEREFOR
Fred G. Kral, Lake Villa, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Aug. 27, 1970, Ser. No. 67,451
Int. Cl. G06k *7/08, 19/08;* **G09b** *19/04;* **G11b** *5/62*
U.S. Cl. 235—61.11 R **8 Claims**

Disclosed is a novel information card having a conductive control stripe in addition a known magnetic stripe and a machine for accepting the novel card and prior art cards and for transporting the cards at different pre-set rates depending on the rate at which the card was transported when recorded. The control stripe on a card actuates a control circuit of the transport machine by closing a selecting circuit through a card sensor so that the machine will transport cards with and without stripes at a selected rate of the pre-set rates.



3,712,974
COMPUTATIONAL HEXADECIMAL SLIDE RULE
John R. Martin, Tulsa, Okla., assignor to Mar-Com Development, Inc., Tulsa, Okla.
Filed Jan. 7, 1972, Ser. No. 216,123
Int. Cl. G06g *1/02*
U.S. Cl. 235—70 R **6 Claims**

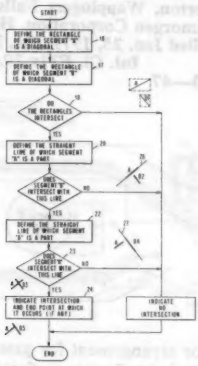


Disclosed herein is a method and apparatus for the rapid addition and/or subtraction computation of higher order mathematics. The method and apparatus are particularly applicable for alphameric manipulations, for example, for the opertions of hexadecimal subtraction and addition.

3,712,975
LINE SEGMENT INTERSECTION TEST
Joseph B. Allen, Poughkeepsie, and Henry E. Lippmann, Croton-on-Hudson, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 21, 1971, Ser. No. 155,095
Int. Cl. G06f *15/06, 15/56*
U.S. Cl. 444—1 **7 Claims**

A method is performed in a data processing system to determine whether or not two straight line segments intersect and to identify the end points if intersection occurs at one of the end points of the line segments. Used in the process are electrical signals representing the Cartesian coordinates of the end points of the two segments being tested. High speed general purpose registers are set to represent the end points and thereafter, by means of high speed register-to-register operations, the following tests are performed. First, a test is made as to whether or not the rectangles of which the line segments form the diagonals intersect. If not, there is no segment

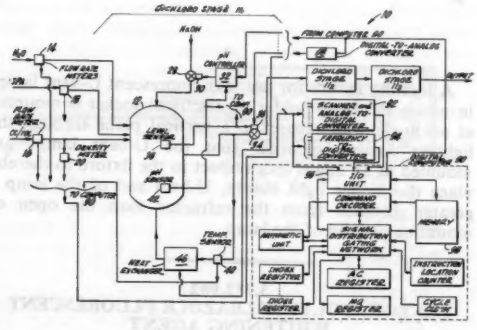
intersection. If so, the test is inconclusive and represents only the possibility that the line segments may intersect. If the rectangles intersect, then one segment is extended to form a line and a test is made as to whether or not the other segment intersects this line. If not, there is no segment intersection. If so, then the test is still somewhat inconclusive so that a further test is made by considering the other segment as part of a line and then testing whether or not the first segment intersects this other line. If not, there is no segment intersection. If so, the conclusion is made that the two line segments do, in fact, intersect.



3,712,976
COMPUTER CONTROLLED DICHLORO REACTION SYSTEM

Robert C. Smith, Baton Rouge, La., assignor to Geigy Chemical Corporation, Greenburgh, N.Y.

Filed July 28, 1970, Ser. No. 58,974
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.12 18 Claims

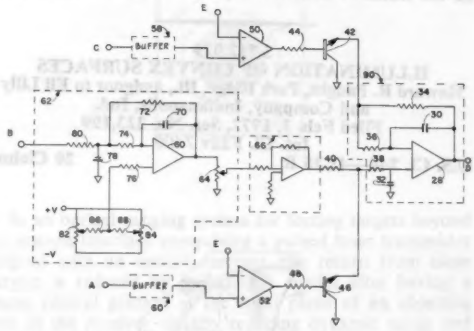


Cyanuric chloride and an alkylamine are reacted in a plural stage reactor system under stored program computer control to form a 2,4-dichloro-6-alkylamine-5-triazine ("dichloro"). The computer operates on the physical reactor system parameters, reported by an array of transducers, in accordance with a stored mathematical model of the reactor system to determine the purity of the output dichloro product, and the effective reactant losses through a hydrolysis mechanism. A series of projected perturbations for the reactor parameters are then employed to seek a direction of change for the array of controlled parameters about their existing values to improve the operational status of the dichloro reaction. In particular, the computer acts via interfacing apparatus and plant controllers to operate and maintain the dichloro reactor system in a preferred status which minimizes hydrolysis losses while maintaining output dichloro at or above a lower purity limit.

3,712,977
ANALOG ELECTRONIC MULTIPLIER, DIVIDER AND SQUARE ROOTER USING PULSE-HEIGHT AND PULSE-WIDTH MODULATION

Willard W. Rice, Jr., Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Feb. 3, 1971, Ser. No. 112,154
Int. Cl. G06g *7/16, 7/20*
U.S. Cl. 235—195 9 Claims



A solid-state analog electronic computing device employing pulse-height, pulse-width modulation having a filtered differential amplifier whose inputs are two trains of modulated pulses; the average value of the first being proportional to the product of first and second input signals and the average value of the second being proportional to the product of a third input signal and the output of the differential amplifier, consequent upon which the output signal is equal to the product of the first and second input signals divided by the third.

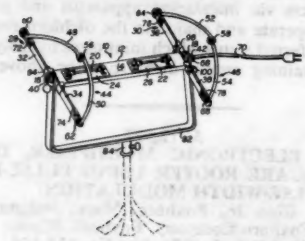
3,712,978
PORTABLE SOFT-LIGHT ASSEMBLY

Ross Lowell, 60 Riverside Drive, New York, N.Y. 10024

Filed Sept. 30, 1970, Ser. No. 76,716
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 12 Claims

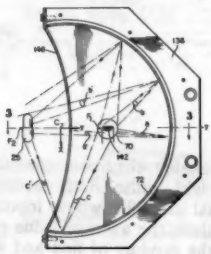
A portable soft-light assembly includes a collapsible frame which has a light source housing as an integral part thereof, and a removable reflector envelope which is mountable on the frame. The collapsible frame includes a pair of foldable supporting members having a folded position and an unfolded position which supporting members provide a desired supporting contour in the unfolded position. The supporting members are pivotally connected to the light source housing in spaced apart relation. The reflector envelope is removably mountable on the supporting members in the unfolded position thereof, and substantially conforms to the supporting contour when so mounted. The light source di-

rects the light toward the interior of the reflector envelope which diffuses the light. Light pattern controlling



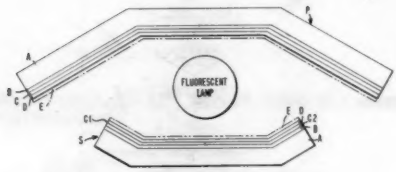
means, such as "barn doors" can be removably mounted on the frame to control the pattern of the diffused light.

3,712,979
ILLUMINATION OF CONVEX SURFACES
Howard R. Padgitt, Park Ridge, Ill., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Feb. 3, 1972, Ser. No. 223,199
Int. Cl. F21v *7/00*
U.S. Cl. 240—41.35 R **20 Claims**



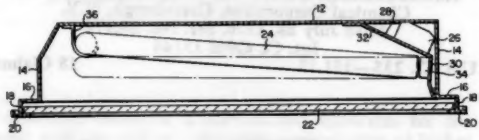
An arcuate mirror in the form of an elongated narrow section of an ellipsoid is used to reflect light from a light source adjacent one focus of the ellipsoid onto a convex surface of a workpiece adjacent the other focus of the ellipsoid. The mirror surface is narrow transversely of a plane intersecting the workpiece but extends in an elongated arc of up to 180° or more in such plane, so as to direct light onto the workpiece surface in converging rays over a wide angle which may be of the order of, or exceed 180°. The workpiece is viewed by one or more viewing systems, and as seen thereby, the workpiece is illuminated with uniform intense light which is so directed as to produce specular reflection from the convex surface over an extended glare area of narrow width, in a pattern which varies with the shape of the surface and the direction from which it is viewed. The illumination is especially useful in inspecting objects having spherical or other three-dimensionally curved surfaces, and permits a single viewing system to observe defects over a wide area not possible with conventional illumination. On a medicinal capsule, viewed from the side, the mirror produces a narrow glare area extending the full length of its cylindrical side and into its rounded ends. On its spherical end, viewed end-on, the mirror produces glare over a radially elongated area. On a spherical ball, viewed in a direction normal to the plane of the mirror arc, the mirror produces a full half-circle of glare area.

3,712,980
REFLECTOR ARRANGEMENT FOR ATTENUATING SELECTED COMPONENTS OF SPECTRAL RADIATION
Bruce Norton, Wappingers Falls, N.Y., assignor to Kollmorgen Corporation, Hartford, Conn.
Filed Jan. 25, 1971, Ser. No. 109,468
Int. Cl. F21v *29/00*
U.S. Cl. 240—47 **5 Claims**



A reflector arrangement for gaseous discharge lamps is described, having reflecting surfaces representing resonant optical cavities at selected wavelengths for attenuating excessive peaks of spectral components characteristic of the primary radiation source.

3,712,981
LIGHTING FIXTURE FOR U-BENT FLUORESCENT LAMPS
William R. Eargle, Jr., Vicksburg, Miss., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 28, 1969, Ser. No. 880,841
Int. Cl. H05b *33/02*
U.S. Cl. 240—51.12 **9 Claims**



A lighting fixture for use with fluorescent U-bent lamps in which the lamp holder or electrical socket is mounted at an angle with respect to a vertical plane through the lighting fixture in order that the U-bent lamps are mounted at an angle with respect to the fixture to thereby place the higher light output, U-bent end of the lamp a greater distance from the refractor than the open or mounting pin end of the lamp.

3,712,982
BENZOXAZOLYLSTILBAZOLE FLUORESCENT WHITENING AGENT
Alfred C. Meunier and Nathan N. Crounse, Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 855,729, Sept. 5, 1969. This application Sept. 13, 1971, Ser. No. 180,166
Int. Cl. C09b *23/14*
U.S. Cl. 260—240 D **1 Claim**

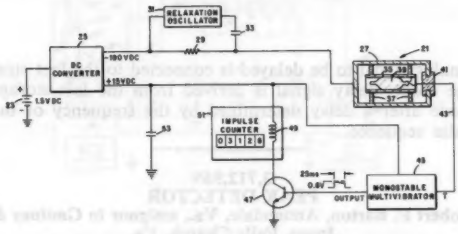
The fluorescent compound 5,4'-bis(benzoxazol-2-yl)-2-stilbazole, which is useful as an optical brightening agent for fibrous and fiber-forming organic materials.

3,712,983

DIGITAL RADIATION DOSIMETER WITH IMPROVED INTEGRATING PULSE IONIZATION CHAMBER

Casimer J. Borkowski, Oak Ridge, and James M. Rochelle, Knoxville, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 9, 1971, Ser. No. 196,888
Int. Cl. G01t 1/18
U.S. Cl. 250—83.6 R 6 Claims



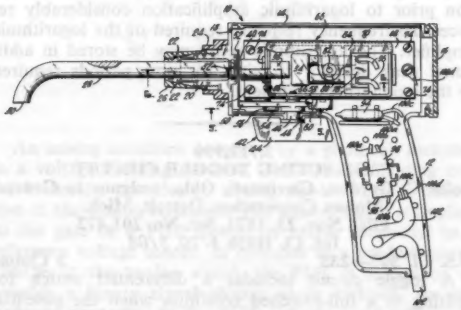
An improved digital radiation dosimeter of the oscillating ionization chamber type including a gas diode connected in series with the chamber anode has been provided with improved operation and miniaturization of the detector chamber. This is made possible by a circuit that adds strobe pulses to the normal DC chamber bias voltage so as to allow the gas diode to discharge even though the active chamber volume is not large enough to produce sufficient diode bias current at low radiation exposure rates.

3,712,984

INSTRUMENT FOR TRANSMITTING ULTRAVIOLET RADIATION TO A LIMITED AREA

Otto E. Lienhard, Upper Montclair, N.J., assignor to Canrad Precision Industries, Inc.

Filed Mar. 15, 1971, Ser. No. 124,084
Int. Cl. H01j 37/00
U.S. Cl. 250—86 41 Claims



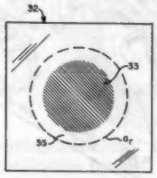
An instrument for transmitting ultraviolet radiation to a limited area within a confined space, such as a dental instrument for treating a limited area within the human mouth. The instrument is hand-held and includes a support on which a source of ultraviolet light is mounted. An elongated light-directing structure is carried by the support and extends from the light source beyond the support so as to have a free end which may be placed in the mouth for directing the light to a limited area for applying ultraviolet energy thereto. A manually operable control is provided to be manipulated by the operator for controlling the transmission of light and thus controlling the application of ultraviolet energy.

3,712,985

OPTICAL SPATIAL FILTER FOR MODIFICATION OF RECEIVED ENERGY VS RANGE

William G. Swarner and Clinton E. Prettyman, Columbus, Ohio, assignors to the United States of America as represented by the Secretary of the Navy

Filed Sept. 17, 1970, Ser. No. 72,908
Int. Cl. G01c 3/08
U.S. Cl. 250—216 7 Claims



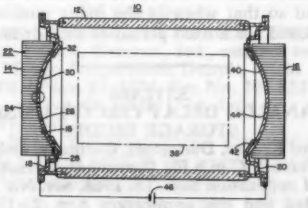
In an optical ranging system for locting targets beyond an uneven interface comprising a pulsed laser transmitter aligned with an optical receiver, the return from close targets is reduced by including a spatial filter having a dense central portion at the focal plane of an objective lens in the receiver thereby reducing dynamic range and preventing receiving saturation from volumetric backscatter near the interface.

3,712,986

ELECTRON IMAGING DEVICE UTILIZING A FIBER OPTIC INPUT WINDOW

Peter R. Collings, Horseheads, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

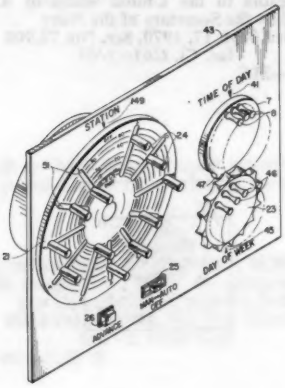
Filed Apr. 3, 1969, Ser. No. 813,109
Int. Cl. H01j 5/16, 39/00
U.S. Cl. 250—227 2 Claims



An electron imaging device in which radiation is directed through a fiber optic input window onto a photoelectric surface. The fiber optic window includes a plurality of fiber optic members in which each of the fiber optics is provided with a non-planar inner surface on which

the photoelectric layer is deposited. In this manner, a greater photoelectric response is obtained to a given insert over a planar surface.

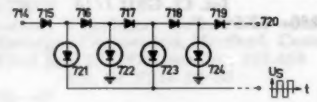
3,712,987
TIMING CONTROL APPARATUS
William L. McKeown, Roswell, N. Mex., assignor to Lek-Trol, Inc., Roswell, N. Mex.
Filed Dec. 23, 1971, Ser. No. 211,567
Int. Cl. H01h *7/00*
U.S. Cl. 307—41 **27 Claims**



Timing control apparatus is disclosed for controlling the time intervals during which electrical power is supplied to selected stations. The apparatus includes a rotatable station plate on which are movably mounted a plurality of pins extending from one surface of the plate. Each pin corresponds to a different one of the stations and may be positioned in any one of a set of positions. The position selected determines whether the station corresponding to the pin is to receive power and if so the time interval during which it is to receive power. The station wheel rotates and successively positions each of the pins in an index position and when a particular pin is in the index position, the determination is made as to whether the station to which the pin corresponds is to receive power. This determination is made by means of a clutch device which, in response to a signal, engages a longitudinal arm and causes one end thereof to move until the arm is stopped by the pin in the index position. Power is applied to the station corresponding to this pin during the time interval the arm is moved. Each of the pins may be adjusted so that when in the index position the arm may be moved for a fixed period of time or not at all.

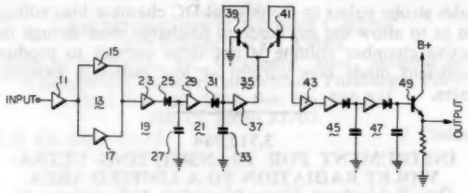
3,712,988
ANALOG DELAY CIRCUIT USING STORAGE DIODES
Gerhard Krause, Darmstadt, Germany, assignor to Fernseh G.m.b.H., Darmstadt, Germany
Original application Sept. 18, 1968, Ser. No. 763,487. Divided and this application Apr. 2, 1971, Ser. No. 130,705
Claims priority, application Germany, Sept. 19, 1967, F 53,536; Oct. 18, 1967, F 53,813; Nov. 18, 1967, F 54,072; Jan. 31, 1968, F 54,687; Feb. 3, 1968, F 54,734; Mar. 5, 1968, F 54,984
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 R **8 Claims**

A plurality of storage diodes are connected in cascade by connecting the anode of each storage diode to the anode of a subsequent one via a connecting diode. A pulse sequence is applied to alternate cathodes and the remaining cathodes are either grounded or receive a pulse sequence of opposite polarity to the first pulse sequence.



Analog signal to be delayed is connected to the first storage diode, delay signal is derived from the last storage diode after a delay determined by the frequency of the pulse sequence.

3,712,989
PEAK DETECTOR
Robert F. Barton, Annandale, Va., assignor to Gautney & Jones, Falls Church, Va.
Filed Sept. 1, 1970, Ser. No. 68,629
Int. Cl. H03k *9/02, 17/00*
U.S. Cl. 307—235 **4 Claims**

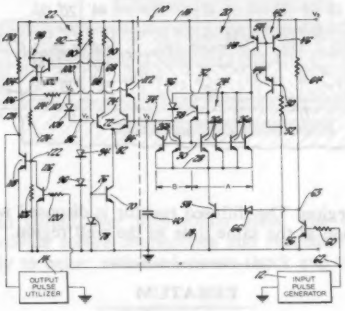


A logarithmic peak detector operable over wide amplitude and frequency ranges comprises a full-wave rectifier followed by a peak detector circuit which in turn drives a logarithmic amplifier. Full-wave rectification prior to logarithmic amplification reduces by one-half the dynamic range required of the logarithmic amplifier. Peak detection prior to logarithmic amplification considerably reduces the frequency response required of the logarithmic amplifier. The logarithmic peaks may be stored in additional peak detector circuitry for time periods required by the monitoring equipment.

3,712,990
FAST-ACTING TOGGLE CIRCUIT
Colin C. Gordon, Cincinnati, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 23, 1971, Ser. No. 201,472
Int. Cl. H03k *5/20, 5/08*
U.S. Cl. 307—235 **3 Claims**

A toggle circuit includes a differential switch for shifting to a full-switched condition when the potential at an input terminal exceeds the potential at a reference terminal. The potential at the input terminal is clamped to the potential at a control terminal through the base-emitter junction of an emitter-follower transistor. In turn, potential at the reference terminal through the anode-cathode junction of an ordinary diode. As a result, the differential switch normally resides in a half-switched condition thereby to minimize the switching time of the

toggle circuit. Further, as the differential switch begins to shift from the half-switched condition toward the full-switched condition, the potential at the control terminal



is removed. Consequently, the potential at the reference terminal decreases thereby to reduce the switching time of the toggle circuit.

3,712,991

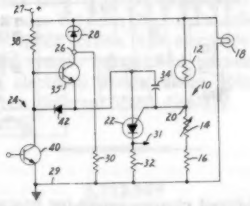
ELECTRICAL CIRCUIT FOR PROVIDING AND MAINTAINING A BINARY SIGNAL CHANGE IN RESPONSE TO A PREDETERMINED CHANGE IN A SENSED ANALOG CONDITION

Donald E. Albright, Hugo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of application Ser. No. 829,357, June 2, 1969, now Patent No. 3,599,349. This application Aug. 12, 1971, Ser. No. 171,202

Int. Cl. H03k *17/56, 3/35*

U.S. Cl. 307—252 F **15 Claims**



An analog condition is sensed by a photocell included in a voltage dividing network. The voltage dividing network thereby provides an analog signal which is indicative of the analog condition. The analog signal is applied to the gate of a PUT having its anode connected to a reference voltage source. In response to a predetermined change in the analog signal, the PUT is turned on to provide a binary signal change at its cathode. An impedance connected to the PUT cathode is of sufficiently low value relative to the impedance as seen at the PUT gate when the PUT is conducting to maintain the PUT in a conducting state when the sensed condition returns to a prechanged state. In one preferred embodiment a detection circuit coupling the PUT gate to the voltage dividing network enables detection at the PUT of only those changes in the analog signal which occur at a predetermined minimum rate of change.

3,712,992

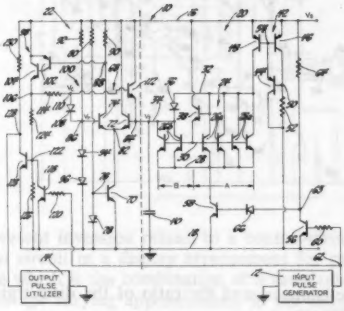
PULSE LENGTH MULTIPLIER CIRCUIT

Burtron D. Schertz and Lester Wilkinson, Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1971, Ser. No. 201,471

Int. Cl. H03k *1/14, 5/04*

U.S. Cl. 307—267 **2 Claims**



A pulse length multiplier circuit includes a capacitor for providing a multiplication factor

$$MF=1+\frac{I_c}{I_d}$$

where I_c is the charging current applied to the capacitor in response to the presence of an input pulse and I_d is the discharging current drawn from the capacitor in response to the absence of an input pulse. The charging current $I_c=I_s$ where I_s is a constant supply current. The discharging current

$$I_d=\frac{M}{N}I_s$$

where M/N is the ratio of the number M of transistors in one parallel connected set of a matched series to the number N of transistors in another parallel connected set of the matched series. As a result, the multiplication factor

$$MF=1+\frac{N}{M}$$

circuit.

3,712,993

PULSE LENGTH MULTIPLIER CIRCUIT

Lamonte R. Edison, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

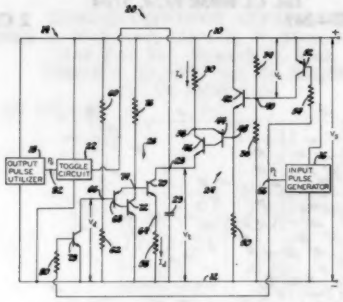
Filed Nov. 23, 1971, Ser. No. 201,533

Int. Cl. H03k *1/14, 5/04*

U.S. Cl. 307—267 **4 Claims**

A pulse length multiplier circuit produces an output pulse having a length equal to the length of an input pulse multiplied by a multiplication factor which is a function only of the ratio of a charging current and a discharging current. A charging voltage is developed by a pair of charging voltage resistances and is applied across a charging current resistance by one pair of opposite conductivity type emitter-follower transistors to define the charging current. A discharging voltage is developed by a pair of discharging voltage resistances and is applied across a discharging current resistance by another pair of opposite conductivity type emitter-follower transistors to define the discharging current. As a result, the multiplication factor

is a function only of the ratio of the charging and discharging current resistances, the ratio of the charging voltage resistances, and the ratio of the discharging voltage resistances.



3,712,994

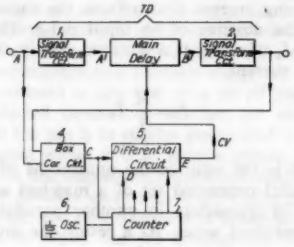
AUTOMATIC TIME CONTROL CIRCUIT

Danio Graziani, Milan, Italy, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 20, 1971, Ser. No. 164,372

Int. Cl. H03k *17/26*

U.S. Cl. 307—293 **3 Claims**



This invention relates to an automatic time control circuit. The time delay of an adjustable time delay circuit is controlled by an error voltage which is derived from the continuous comparison of the time delay with another time obtained from a very stable source such as a crystal oscillator.

3,712,995

INPUT TRANSIENT PROTECTION FOR COMPLEMENTARY INSULATED GATE FIELD EFFECT TRANSISTOR INTEGRATED CIRCUIT DEVICE

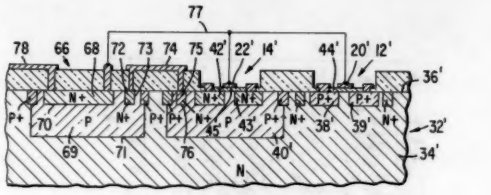
Goetz Wolfgang Steudel, Flemington, N.J., assignor to RCA Corporation

Filed Mar. 27, 1972, Ser. No. 238,486

Int. Cl. H01l *19/00*

U.S. Cl. 307—304 **7 Claims**

A COS/MOS integrated circuit device of the type having a diffused well region and complementary insulated gate field effect transistors inside and outside the well region, respectively, has an integral circuit for protecting the gate insulators of the insulated gate field effect transistors from destructive transients. The protection circuit includes a diffused resistor made at the same time as the source and drain regions of the transistor which is within the well region. The diffused resistor is disposed within a region made at the same time as the well region.



ERRATUM

For Class 310—247 see:
Patent No. 3,711,907

3,712,996

STABILIZATION OF PLASMA GENERATORS

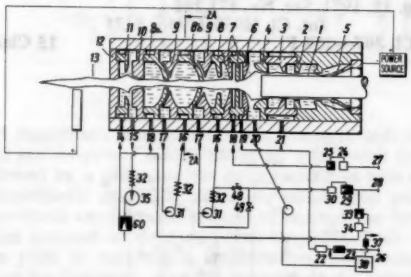
Tibor Kugler, Sins, Switzerland, assignor to Lonza Ltd., Basel, Switzerland

Continuation-in-part of abandoned application Ser. No. 43,014, June 3, 1970. This application Feb. 24, 1972, Ser. No. 228,880

Claims priority, application Switzerland, June 10, 1969, 8,774/69

Int. Cl. H05b *31/26*

U.S. Cl. 313—231 **3 Claims**



A liquid stabilized plasma generator has a path of flow for the arc divided into sections with the flow channel constricted at the transitions between the sections, the stabilizing liquid being divided in each section into partial streams one of which is discharged from its section in the vicinity of the respective constrictor through a narrow gap extending near the inner surface of the liquid vortex. Various arrangements of divisions are provided.

3,712,997

RUGGEDIZED ELECTRICAL CONNECTING LEAD

James K. Fisher, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

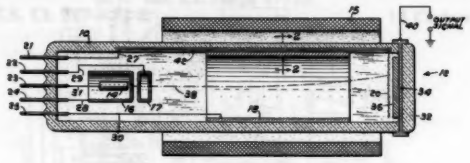
Filed Dec. 21, 1970, Ser. No. 100,072

Int. Cl. H01j *5/00*

U.S. Cl. 313—317 **7 Claims**

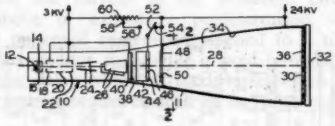
In an electron tube such as a vidicon, conductor leads are used to connect various electrodes in the tube to external terminals. Some of the leads are of a considerable

length in that they connect to electrodes which are located at an end opposite to that of the terminals. These leads are embedded in internal grooves in the glass envelope



wall and fritted over with solder glass. The embedded leads provide secure connections and ruggedize the tube assembly to better withstand severe shock and vibrations.

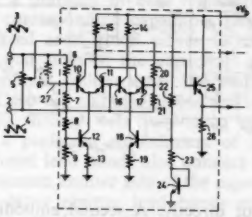
3,712,998
CATHODE RAY TUBE FOR PRODUCING VARIABLE SIZED DISPLAYS
Michael S. Mauck, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Oct. 21, 1970, Ser. No. 82,628
Int. Cl. H01j *29/80*
U.S. Cl. 315—17 **15 Claims**



A cathode ray tube is provided with first and second apertured electrodes between the tube's deflection apparatus and the phosphor screen. The electrode closest to the tube's deflection system is switched between the voltage of the second electrode and a lower voltage for "gear shifting" between different sized displays.

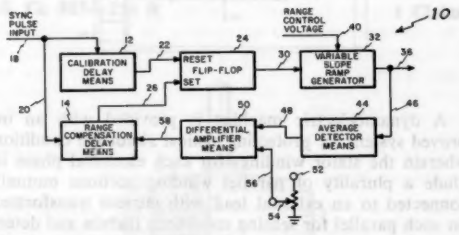
3,712,999
CONTROL-CIRCUIT FOR A DEFLECTION CIRCUIT OF A DISPLAY ARRANGEMENT
Wouter Smeulers, Paulus Joseph Maria Hovens, and Jan Abraham Cornelis Korver, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 2, 1970, Ser. No. 86,146
Claims priority, application Netherlands, Nov. 4, 1969, 6916661
Int. Cl. H01j *29/70*
U.S. Cl. 315—19 **12 Claims**

A TV deflection system that includes a control circuit for producing a voltage which is the combination of a sawtooth voltage, a voltage varying approximately at the third power, and a parabolic voltage. The arrangement comprises a long-tailed pair circuit connected as a multiplier circuit to which are applied a parabolic voltage and a voltage that is the sum of a DC voltage and a sawtooth voltage. The parabolic voltage and the sawtooth voltage are of the same frequency. In order to reverse the polarity of the parabolic component of the output signal, a second long-tailed pair circuit is added in which a parabolic voltage is multiplied by a direct voltage. The output voltages of the long-tailed pair circuits are added. The system lends itself to fabrication as an integrated circuit.



The present invention relates to a control-circuit for a deflection circuit in a display arrangement for producing a voltage which is the combination of a sawtooth voltage and a voltage varying approximately in the third power, as the case may be, combined with a parabolic voltage.

3,713,000
SWEEP GENERATOR WITH AUTOMATIC CENTERING
Carl R. Driskell, Winter Park, and Joseph R. Owen, Orlando, Fla., assignors to the United States of America as represented by the Secretary of the Navy
Filed Nov. 26, 1971, Ser. No. 202,430
Int. Cl. H01j *29/70*
U.S. Cl. 315—24 **5 Claims**

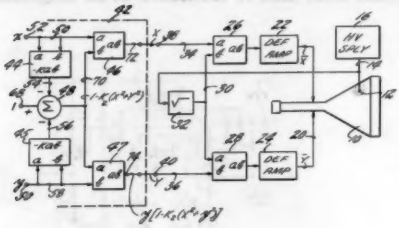


An automatically centering variable slope television sweep circuit wherein a variable sync signal delay means initiates output of a voltage variable slope generator at times determined by a closed circuit control means comprising an average output detector and a differential amplifier so that when the slope is changed it does so about its own center.

3,713,001
HIGH VOLTAGE DEFLECTION CORRECTION IN CRT DISPLAYS
Glenn C. Waehner, Riverside, Conn., and Thomas J. Ray, Yonkers, N.Y., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Jan. 20, 1972, Ser. No. 219,465
Int. Cl. H01j *29/70*
U.S. Cl. 315—276 D **2 Claims**

The X and Y deflection voltages for a CRT display are corrected to accommodate excursions in the acceleration or anode voltage of a CRT display by multiplication with

a signal which is a function of the square root of the high voltage. The invention may be practiced following pincushion correction (correction for a planar CRT screen



geometry), or directly. A second embodiment integrates pincushion and anode voltage correction thereby to require fewer and simpler circuits.

3,713,002

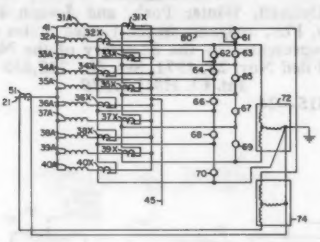
DYNAMOELECTRIC MACHINE WITH DIFFERENTIAL PROTECTION SYSTEM INCLUDING MEANS FOR AIR GAP MONITORING

Eugene C. Whitney, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 17, 1972, Ser. No. 218,105

Int. Cl. H02h *7/06*

U.S. Cl. 317—13 R **6 Claims**



A dynamoelectric machine is provided with an improved system for protecting against abnormal conditions wherein the stator windings for each electrical phase include a plurality of parallel winding portions mutually connected to an external lead with current transformers on each parallel for sensing conditions therein and detecting unbalanced conditions therebetween such as may be caused by air gap non-uniformity. An additional current transformer is provided on the external lead for a given phase and interconnected, such as through appropriate relaying means, to the current transformers on the individual parallels for detecting overall machine unbalances. The invention is particularly beneficial in machines such as large generators where it is important to insure stable air gap distribution while minimizing the number and size of necessary conductors.

3,713,003

FAULT OR LEAK DETECTOR

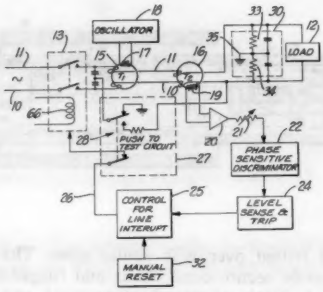
Ralph E. Benham, Arcadia, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.

Continuation-in-part of application Ser. No. 856,095, Sept. 8, 1969. This application Feb. 16, 1971, Ser. No. 115,252

Int. Cl. H02h *3/16*

U.S. Cl. 317—18 D **16 Claims**

A fault detector for an A.C. circuit including an oscillator inductively coupled to the A.C. lines to impress a signal voltage relatively high in frequency and relatively much lower in voltage thereon and a sense circuit responsive to high frequency current in the line. This current only flows when a leak or fault from the line to earth is present. The resulting sense circuit signal is amplified and passed through a phase sensing circuit to eliminate stray fault readings and used to trip a circuit interrupter to disconnect the load from A.C. power.



3,713,004

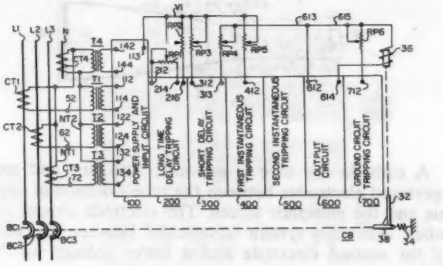
CIRCUIT BREAKER INCLUDING IMPROVED PROTECTIVE DEVICE

Joseph F. Skeehan, North Versailles, and William H. South, McKeesport, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 30, 1972, Ser. No. 239,506

Int. Cl. H01h *47/18*

U.S. Cl. 317—33 R **6 Claims**

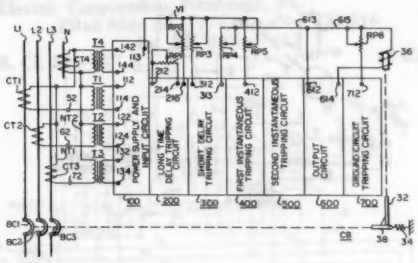


A circuit breaker including separable contacts, an operating means or mechanism for opening and for closing and latching in the contacts, and an overcurrent protective device including means which are responsive to the current in the separable contacts and an electrical circuit which is being protected by the circuit breaker to actuate the operating means of the circuit breaker to open said contacts upon the occurrence of predetermined operating conditions. The protective device includes means which actuate said operating means after a predetermined time delay which may vary inversely with the current for certain overcurrents or which may be substantially fixed or of a predetermined duration for certain overcurrents and at least one means which is responsive substantially instantaneously when the current in the associated contacts or electrical circuit exceeds or increases above a predtermined value and additional means which is connected to render the last-mentioned means inoperative or to inhibit its operation during certain operating conditions of the circuit breaker even when the current in the contacts is relatively low compared with the continuous current rating of the circuit breaker.

3,713,005
CIRCUIT BREAKER INCLUDING IMPROVED OVERCURRENT PROTECTIVE DEVICE

Joseph C. Engel, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 30, 1972, Ser. No. 239,510
Int. Cl. H01h 47/18
U.S. Cl. 317—33 R 10 Claims

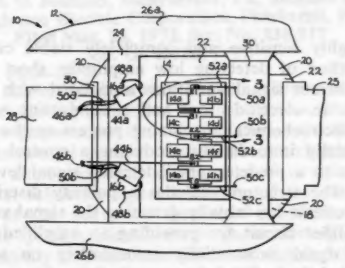


A circuit breaker including an overcurrent protective device of the inverse time delay type which is responsive to the current in an electrical circuit which is being protected by the associated circuit breaker. The protective device may include means for producing periodic pulses of current of substantially a predetermined width and of substantially a predetermined frequency or pulse repetition rate which may be adjustable. The magnitude of such pulses varies with substantially the square of the current or the highest line current in the protected circuit. When the current in the protected circuit increases above or exceeds a predetermined value or level, the pulses of current are applied to a timing or integrating capacitor to provide a predetermined output after a time delay which varies inversely with substantially the square of the current in the protected circuit.

3,713,006
HYBRID TRANSISTOR

Thomas P. Litty, Los Angeles, Ellsworth R. Moss, Palos Verdes, and Edward J. Rice, Los Angeles, Calif., assignors to TRW Inc., Los Angeles, Calif.

Continuation-in-part of application Ser. No. 113,272, Feb. 8, 1971. This application Aug. 23, 1971, Ser. No. 173,774
Int. Cl. H01l 19/00
U.S. Cl. 317—101 A 41 Claims

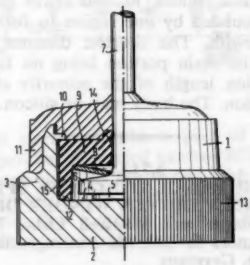


A hybrid transistor comprising a transistor die and internally disposed capacitive elements configured to reduce substantially the inductance of the transistor's input, typically the base in common emitter configurations, while at the same time providing a built-in first stage network for broad-band impedance matching and impedance transformation. In a basic embodiment of this invention, the transistor die is disposed upon a common metallized area of a transistor package. Typically, the collector regions are in electrical contact with this metallized area. Relatively short and uniform base lead bonds connect each of a plurality of base regions to one side of an array of corresponding capacitors disposed upon a second metallized area which serves as the common emitter. The second sides of the capacitors are in contact with the common emitter area. The emitter regions of the transistor die are likewise connected to the common emitter area through relatively short and uniform lead bonds. In a preferred embodiment of the present invention, additional lead bonds also connect the emitter regions to the common emitter side of the capacitor array. By making the latter emitter lead bonds of the same length and contour as the base lead bonds, and by interleaving them in parallel with the base lead bonds, a further reduction of the input inductance of the invented hybrid transistor is achieved. The present invention discloses a transistor having superior high frequency operating characteristics than heretofore attainable at power levels in excess of 40 watts. The superior operating characteristics, including low input inductance and low impedance transformation, enable broad-band uniform amplication over as much as one octave of the frequency band above 100 mHz.

3,713,007
SEMICONDUCTOR COMPONENT WITH SEMICONDUCTOR BODY SEALED WITHIN SYNTHETIC COVERING MATERIAL

Georg Walter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 24, 1971, Ser. No. 146,087
Claims priority, application Germany, June 4, 1970, P 20 27 598.3
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 1 Claim



A semiconductor component has a semiconductor body, a cup-shaped housing having a wall and a base conjointly defining a hollow for receiving the semiconductor body. A cover having an opening and a wall-like extension surrounding the semiconductor is also provided. An electrode for the semiconductor extends through this opening in electrically insulated relation to the cover. The wall-like extension has an end surface whereat the cover rests upon the base and a pressure member exerts a force on the cover so that the end surface presses against the base in seal tight relation to the latter, whereby the synthetic material is prevented from penetrating to the region of the semiconductor body when the material is applied and still in the plastic condition.

3,713,008

SEMICONDUCTOR DEVICES HAVING AT LEAST FOUR REGIONS OF ALTERNATELY DIFFERENT CONDUCTANCE TYPE

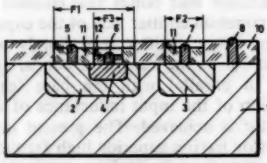
Heinz Dorendorf, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Original application Nov. 13, 1963, Ser. No. 323,280. Divided and this application May 8, 1967, Ser. No. 648,179

Claims priority, application Germany, Nov. 26, 1962, S 82,756

Int. Cl. H01l *19/00*

U.S. Cl. 317—235 R 7 Claims



Described is a semiconductor device having at least four regions of alternately different conductance type and comprising a flat plate-shaped body of crystalline semiconductor material. The main portion of the body has a first type of conductance forming one flat surface of the plate. Two diffusion-doped surface regions of the opposed conductance type are located in the body at the other flat surface of the plate and cover respective surface areas of smaller size than, and positioned within, the other plate surface. These two regions forming respective p-n junctions with the main portion and being spaced from each other by part of the main portion a distance not larger than five times the median diffusion length of the minority charge carriers in the main portion. Another region, having the same conductance type as the main portion and having smaller dimensions than one of the two opposed-type conductance regions, located at the other plate surface and surrounded by one region to form a third p-n junction therewith. The shortest distance of the other region from the main portion being no larger than the median diffusion length of the minority charge carriers in the one region. The body may be silicon.

3,713,009

SYSTEM FOR REGULATING THE SPEED OF AN AXIALLY DRIVEN WINDER DRIVE

Herbert Poppinger and Manfred Liska, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

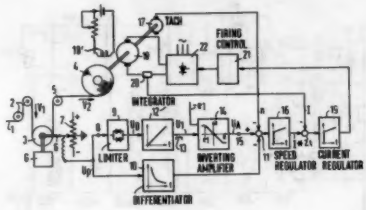
Filed Nov. 12, 1970, Ser. No. 88,540

Claims priority, application Germany, Nov. 15, 1969, P 19 57 623.9

Int. Cl. B65h *59/38*

U.S. Cl. 318—6 7 Claims

A system for regulating the speed of an axially driven winder for textile and other thread or web material, which operates to maintain constant mechanical tension in the material being wound. The system comprises a winder motor of variable rotary speed and motor control means for varying the rotary speed. A dancer roller engageable with the material being wound, deflects from a given position when the pulling tension of the material, as it is being wound, departs from the desired value. Each deflection of the dancer roller causes the issuance of a voltage signal whose amplitude and polarity depend upon magnitude and direction of the dancer-roller deflection. An integrator and a differentiator are connected in parallel to the voltage signal and conjointly furnish a datum input to a speed regulator whose pilot input depends upon the rotary winder speed and whose output is connected to the motor control means for varying the rotary speed to maintain the pulling tension in the material at a constant value. An amplitude limiter is interposed between the



integrator and the signal voltage means. A current regulator subordinate to the speed regulator is connected between the output of the speed regulator and the motor control means. The current controller derives its pilot magnitude from the current in the motor energizing circuit, the datum input of the current regulator being delivered by the output of the speed regulator.

3,713,010

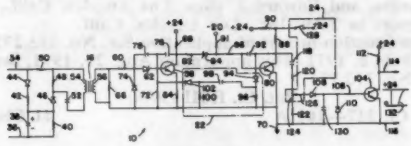
DIODE-CAPACITOR CHARGE AND DISCHARGE CIRCUIT

Robert W. Drushel, Farmington, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich.

Original application Oct. 3, 1966, Ser. No. 583,875. Divided and this application July 6, 1971, Ser. No. 160,042

Int. Cl. H03k *5/18, 5/20*

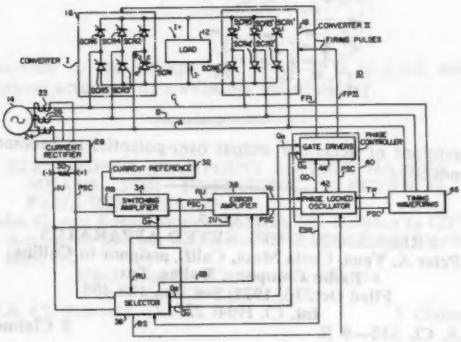
U.S. Cl. 320—1 3 Claims



A highly sensitive and completely stable circuit for and method of detecting low amplitude, short duration direct current signal variations associated with sparking between an electrode tool and a conducting workpiece in an electrochemical machining process or the like and substantially immediately producing a control signal in response to a predetermined detected signal level is disclosed. The structure includes a polarity discriminating sensing circuit for initially detecting the signal variations, an amplifier circuit for providing an amplified and stabilized signal substantially immediately on sensing a signal variation of the proper polarity and output circuit for providing an output signal in response to a selected portion of the amplified and stabilized signal, including means for selecting the level of the selected signal portion operable to provide the output signal, means for cutting off the amplified and stabilized signal when the selected level is below a predetermined minimum and means

responsive to a number of amplified and stabilized signals, which have a level below the selected level received in a predetermined time for providing an output signal.

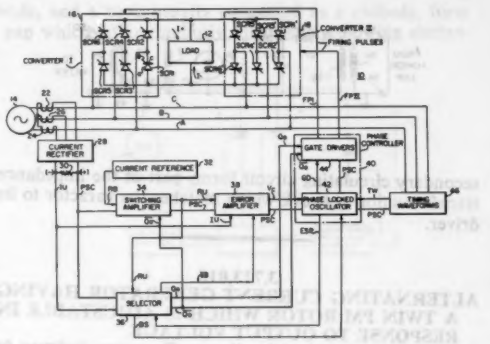
3,713,011
CONVERTER APPARATUS
Frederick O. Johnson, Monroeville, and Theodore M. Heinrich, Murrysville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 28, 1972, Ser. No. 238,916
Int. Cl. H02m *7/12*
U.S. Cl. 321—27 R **17 Claims**



Converter apparatus includes a power converter having controlled rectifier devices connected to interchange electrical power between a source of alternating potential and a direct current load circuit, a phase controller for controlling the conduction angle of the controlled rectifier devices, and circuitry for maintaining synchronous operation between the phase controller and the power converter. The circuitry for maintaining synchronous operation constrains the conduction angle between predetermined end stops, by providing a composite end stop signal, and comparing it with predetermined threshold levels. The composite end stop signal is made up of segments selected from a plurality of timing waveforms which are responsive to the source of alternating potential, with the segments selected being determined by the conduction angle.

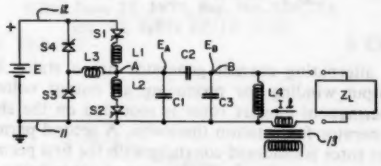
3,713,012
CONVERTER APPARATUS
Frederick O. Johnson, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 28, 1972, Ser. No. 238,917
Int. Cl. H02m *7/12*
U.S. Cl. 321—27 R **13 Claims**

Dual converter apparatus including first and second converters having controlled rectifier devices, and a load circuit. A phase controller controls the conduction angle of the controlled rectifier devices to interchange power between alternating and direct current circuits. A bidirectional reference signal indicative of the desired operation of the converter apparatus is switched in response to predetermined circuit parameters to provide a substantially unidirectional reference signal. A feedback circuit provides a unidirectional feedback signal responsive to the actual operation of the converter. A comparator provides an error signal for the phase controller in response to the unidirectional reference and feedback signals. The dead time during which no load current flows, while switching from one converter to the other, is substantially reduced by a circuit which forcibly retards the conduction angle to a predetermined end stop, switches the converters while at this end stop, biases the error signal to rapidly advance the conduction angle away



from the end stop, and terminates the biasing of the error signal when the on-coming converter provides load current.

3,713,013
VOLTAGE CONTROLLED INVERTER CIRCUIT FOR VARIABLE SUPPLY VOLTAGES AND LOADS
Edward H. Phillips, Los Altos, and Raymond D. Underwood, Saratoga, Calif., assignors to Programmed Power, Inc., Menlo Park, Calif.
Filed Apr. 12, 1972, Ser. No. 243,193
Int. Cl. H02m *7/52*
U.S. Cl. 321—45 R **10 Claims**

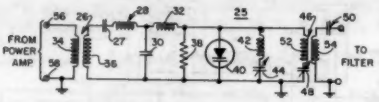


An inverter circuit includes a pair of power SCR's with inverse parallel connected control SCR's. The firing time of the control SCR's are varied with respect to the power SCR's in accordance with variations in supply voltage and load to allow a greater or lesser oscillatory voltage in the power SCR resonant circuit.

3,713,014
VARACTOR MULTIPLIER INCLUDING INPUT CIRCUIT FOR INCREASING BAND OF OPERATION
James A. Wagner, Palatine, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Aug. 11, 1971, Ser. No. 170,833
Int. Cl. H02m *5/30*
U.S. Cl. 321—69 NL **14 Claims**

A varactor multiplier has an input circuit including a secondary circulating circuit comprised of an inductor and a capacitor which are tuned to a frequency near the second harmonic of the input frequency thereby providing a net capacitance at the input frequency which lowers the composite resonant frequency of the multiplier so that its band of operation is increased. The secondary circulating circuit also provides a net inductance at harmonic

frequencies of a higher order than the second thereby desensitizing the multiplier to tuning and temperature changes of the output and idler circuits. Furthermore, the



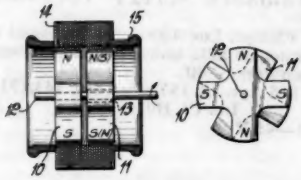
secondary circulating circuit forms part of the impedance transformation network which matches the varactor to its driver.

3,713,015

ALTERNATING CURRENT GENERATOR HAVING A TWIN PM ROTOR WHICH IS ADJUSTABLE IN RESPONSE TO OUTPUT VOLTAGE

Manfred Frister, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 4, 1972, Ser. No. 223,639
Claims priority, application Germany, Feb. 9, 1971, P 21 06 057.1
Int. Cl. H02p *9/40;* **H02k** *21/16*
U.S. Cl. 322—28 **15 Claims**



An alternating current generator has a stator having an output winding for producing an output voltage. A first permanent magnet rotor is mounted on the shaft of the generator for rotation therewith. A second permanent magnet rotor is mounted coaxially with the first permanent magnet rotor on the shaft, the second rotor being angularly adjustable with respect to the shaft about the common axis. Control means adjust the angular position of the second rotor, relative to the front rotor in response to changes of the output voltage.

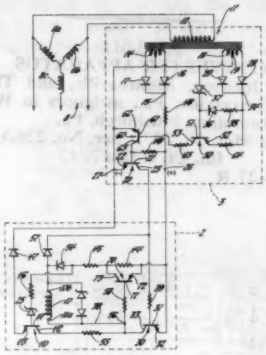
3,713,016

GENERATOR FIELD COIL ENERGIZING REVERSING CIRCUIT

Richard N. Lehnhoff, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1972, Ser. No. 223,095
Int. Cl. H02p *9/30*
U.S. Cl. 322—28 **5 Claims**

A generator field coil energization reversing circuit for use with a generator of the type having a field coil and in combination with an associated potential regulator of the type responsive to generator output potential reaching a predetermined magnitude to operate an associated control switch to the electrical circuit open condition. The generator field is connected across a source of direct current generator field coil energizing potential in one polarity relationship through the current carrying electrodes of a forward direction generator field coil switching transistor and the potential regulator control switch, the transistor being conductive only while the control switch is conductive, and in a reverse polarity relationship through the current carrying electrodes of a reverse direction generator field coil switching transistor which is responsive to



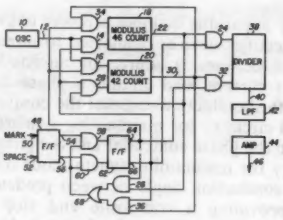
conditions of generator output over-potential to become conductive.

3,713,017

FREQUENCY SHIFT KEYED APPARATUS

Peter A. Vena, Costa Mesa, Calif., assignor to Collins Radio Company, Dallas, Tex.

Filed Oct. 13, 1971, Ser. No. 188,405
Int. Cl. H04l *27/12*
U.S. Cl. 332—9 R **5 Claims**



A digitalized FSK modulating system whereby the transition between frequencies provides substantially continuous phase characteristics.

3,713,018

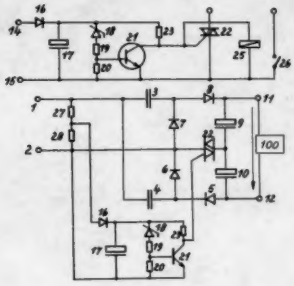
ELECTRONIC PHOTO FLASH APPARATUS OPERATING FROM ALTERNATING CURRENT CIRCUITS OF DIFFERENT VOLTAGES

Christhard Tscheuschner, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed July 1, 1971, Ser. No. 158,955
Claims priority, application Germany, July 2, 1970, P 20 32 733.7
Int. Cl. G05f *5/00;* **H02m** *7/24*
U.S. Cl. 321—15 **7 Claims**

Electronic photo flash apparatus powered by energy stored in capacitors which are charged from alternating current circuits or "mains." Circuits are provided to enable the capacitors to be charged to approximately the same voltage each time, even though at times the apparatus may be plugged into an alternating current circuit having one of the standard voltages (e.g., 110 or 115 volts) and at other times may be plugged into an alternating current circuit having one of the other standard voltages substantially double the first mentioned voltage (e.g., 220 or 230 volts). In one embodiment, a hand operated switch is used, depending upon the voltage of the

mains into which the apparatus is plugged. In another embodiment, the apparatus functions automatically in

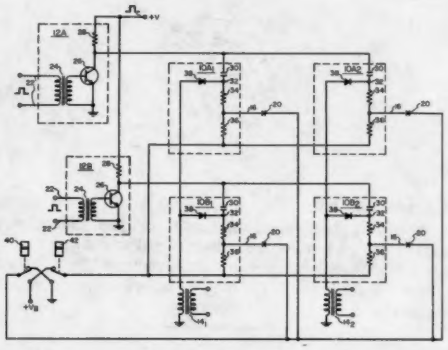


response to the voltage into which it is plugged, and manual actuation of a switch is not necessary.

3,713,019
ELECTRONIC SCANPOINT MATRIX HAVING MEANS FOR DETECTING ELECTRICAL FAILURES THEREIN

John G. van Bosse, Mount Prospect, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Aug. 5, 1971, Ser. No. 169,394
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 7 Claims



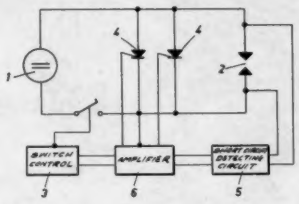
An electronic scanpoint matrix of the resistor-capacitor-diode type for supervision of a plurality of signal lines has one side of each signal line and each scanpoint selectively coupled in common via relay contacts to a source of biasing voltage or ground. The relay contacts are operated to selectively apply a biasing voltage or ground potential to the scanpoints and signal lines to provide a matrix output which is representative of electrical failures in driver transformers, driver transistors, scanpoint capacitors, scanpoint diodes or sense line output transformers.

3,713,020
APPARATUS FOR DETECTING A SHORT CIRCUIT ACROSS A GAP BY COMPARING THE GAP VOLTAGE WITH A DELAYED PORTION THEREOF

Henning Kohler, Wermelskirchen, Germany, assignor to AEG-Elotherm G.m.b.H., Remscheid-Hasten, Germany

Filed Apr. 4, 1969, Ser. No. 813,577
Int. Cl. G01r *31/02*; G08b *21/00*
U.S. Cl. 324—51 5 Claims

A method and apparatus for detecting a short circuit across a gap by detecting the voltage across the gap and combining that voltage with a second voltage produced by delaying the gap voltage so that only a short circuit will produce a signal sufficient to indicate a short circuit condition. More particularly the invention is intended for use with apparatus for the electrochemical removal of material whereby a workpiece, usually connected as an anode, and a tool, usually connected as a cathode, form a gap which is continuously filled with a flowing electro-

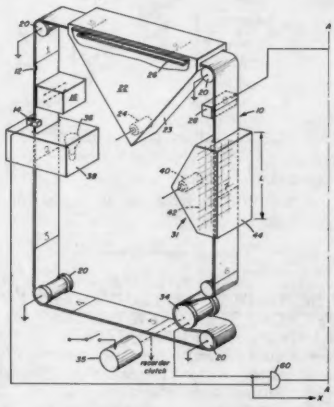


lyte solution so that as direct current flows through the electrolyte and across the gap, material will be removed from the anode. Shunting devices such as thyristors are preferably connected in parallel across the gap so that when the combination of the gap voltage and a second voltage produced by delaying the gap voltage indicates a short circuit condition, these shunting devices can dissipate the energy resulting from the short circuit condition and prevent the overflow of current across the gap.

3,713,021
SENSITOMETER FOR PHOTOCONDUCTIVE MATERIALS

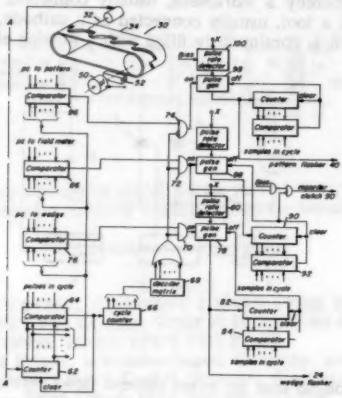
George M. Letson, Scottsville, Robert J. Whitman, Conesus, and James J. Scott, Jr., Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 25, 1971, Ser. No. 156,751
Int. Cl. G01r *29/12, 5/28*
U.S. Cl. 324—32 6 Claims



Samples of photoconductive materials, arranged in the form of a continuous belt, are sensitometrically tested by successively passing such samples past erase, charge, and expose stations. Two kinds of exposure stations are provided, viz one in which the samples are flashed via an optical wedge and one in which the samples are randomly

flashed for the purpose of simulating actual use for the samples. The samples in the photoconductive belt are periodically wedge flashed during certain cycles of the belt;



and randomly flashed during other cycles. A recorder device, operable while wedge flashing, produces sets of V—log E records for the respective cycles.

3,713,022

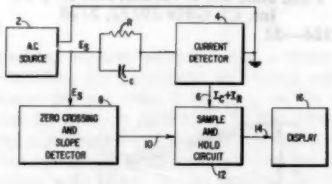
CAPACITANCE MEASUREMENT BY PHASE-CONTROLLED SAMPLING

Robert D. McRay, Scotia, N.Y., assignor to Systomation Incorporated, Elnora, N.Y.

Filed Dec. 17, 1971, Ser. No. 209,062

Int. Cl. G01r *27/26*

U.S. Cl. 324—60 C **11 Claims**



Measurement of values of unknown capacitors while connected in parallel with unknown resistors by timing the measurement to occur at the phase point where the resistor current is zero. The timing is provided by a zero crossing and slope detector.

3,713,023

ANALOG-TO-DIGITAL CONVERTER UTILIZING DIFFERENT FEEDBACK EFFECTS TO OBTAIN ACCURACY AND RESOLUTION

Eric Metcalf and Howard Anthony Dorey, Farnborough, England, assignors to The Solarton Electronic Group Limited, Farnborough, England

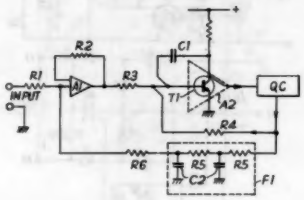
Continuation of abandoned application Ser. No. 495,071, Oct. 12, 1965. This application Nov. 2, 1970, Ser. No. 86,274

Claims priority, application Great Britain, Oct. 16, 1964, 42,392/64

Int. Cl. G01r *17/06, 19/26*

U.S. Cl. 324—99 D **10 Claims**

An analog-to-digital converter provides improved resolution without attendant loss of accuracy or speed of operation over known converters. This is achieved by providing slow-acting feedback to the integrating circuit for accuracy and fast-acting feedback to that circuit for increasing resolution. The fast-acting feedback consists of quanta



of charge of defined magnitude and the slow-acting feedback is derived from the fast feedback either by smoothing or by reducing the frequency of the quanta.

3,713,024

CALIBRATABLE AMMETER HAVING A RESTORING MAGNET MOUNTED ON A BENDABLE TAB

Bernard R. Banus, Cleveland, Ohio, assignor to Sterling Manufacturing Company

Filed Dec. 17, 1964, Ser. No. 419,115

Int. Cl. G01r *1/00, 5/16*

U.S. Cl. 324—146 **3 Claims**

Calibratable current-responsive meter in which a magnet providing the restoring force for the indicator is mounted on a support bendable toward and away from a current-responsive magnet on the arbor of the indicator whereby the restoring force may be increased or decreased, respectively.

3,713,025

PHASE SLIP CORRECTOR MEANS AND METHOD FOR SYNCHRONIZATION OF PSEUDORANDOM GENERATING MEANS IN MULTISTATION NETWORKS

Robert J. McNair, Cincinnati, Ohio, assignor to Avco Corporation, Cincinnati, Ohio

Continuation of abandoned application Ser. No. 656,750, July 28, 1967, which is a division of application Ser. No. 457,345, May 20, 1965, now Patent No. 3,350,644, dated Oct. 31, 1967. This application Dec. 4, 1969, Ser. No. 882,282

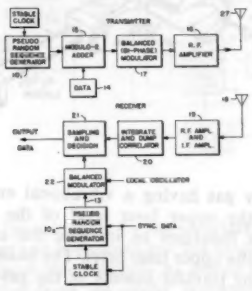
The portion of the term of the patent subsequent to Oct. 30, 1984, has been disclaimed

Int. Cl. H04h *3/00*

U.S. Cl. 325—58 **1 Claim**

In certain two-way communications systems involving a multiplicity of stations, pseudorandom sequence generators are used to code mark-space symbols transmitted by wide band radio frequency waves. The data transmitted are encoded by multiplexing the information with the output of a pseudorandom sequence generator. One such generator is provided at each station for both transmission and reception. Assuming the designation of a particular station as Control Central, the prior art shows

arrangements for so synchronizing the various pseudorandom sequence generators so that the sequence provided at any outlying station which is receiving will lag, in real time, behind that generated and used for transmission at Control Central, by an amount proportional to signal-travel time, i.e., the distance between the stations. However, assuming such synchronization, systemwise, there is need to make suitable adjustments to permit a given outlying station to transmit back to Control Central. Two-way communication between outlying stations complicates the problem. The invention herein disclosed solves



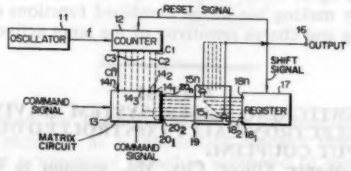
the problem by synchronizing a pseudorandom sequence generator at Control Central with principal reference outputs of pseudorandom generating means at each outlying station. Such generating means comprises a pseudorandom generator per se and a delay line providing a principal reference sequence. The delay line is tapped to provide access to any one of a plurality of time-advanced sequences. When it is desired to transmit back to Control Central, a predetermined time-advance sequence is employed. Other time sequences are used for communication with other outlying stations.

3,713,026

APPARATUS FOR GENERATING PULSE TRAINS WITH PREDETERMINED ADJACENT PULSE SPACING

Moritada Kubo, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 14, 1970, Ser. No. 97,941
Claims priority, application Japan, Dec. 13, 1969, 44/99,841
Int. Cl. H03k 5/13
U.S. Cl. 235—152 **5 Claims**



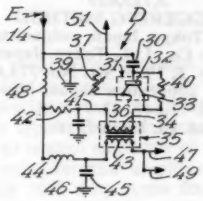
A program control device for generating a pulse train having predetermined time intervals between adjacent pulses includes a pulse oscillator for generating clock pulses of a predetermined frequency and a counter for generating an output each time it counts up to one of a plurality of preset counts of the clock pulses. Further provided is receiving means, such as a matrix circuit which is responsive to command signals and which receives outputs from the counter for generating signals corresponding to respective preset counts of the counter according to a prescribed programmed order. A shift register produces outputs sequentially from each of the stages thereof responsive to a shift signal, and a logic circuit is connected to the shift register and to the generating means for generating the logical product of one output from the shift register and an output from the receiving means, the output from the logic circuit constituting the pulse train output of the program control device. The output of the logic circuit is also fed to the counter to reset the counter and to the shift register to act as the shift pulse.

3,713,027

TELEVISION ANTENNA MULTIPLE LEAD-IN SYSTEMS

Barton T. Setchell, 2505 S. Ocean Blvd., Palm Beach, Fla. 33480

Filed Nov. 12, 1969, Ser. No. 875,831
Int. Cl. H04b 1/06
U.S. Cl. 325—308 **4 Claims**



Television antennas used on hotels, motels, apartment houses and the like are normally connected to a considerable number of television sets, usually resulting in a great reduction in the RF signal delivered to each set. To prevent this difficulty, a low DC voltage is applied to the incoming trunk line from the antenna. This low D.C. voltage is used to control a transistor at each television outlet. The transistor functions to deliver an amplified RF signal to a RF transformer, the secondary of which is connected to the television antenna terminals. Virtually no signal loss is experienced at each outlet, and each set is isolated from the others on the same trunk line by the transistor circuit.

3,713,028

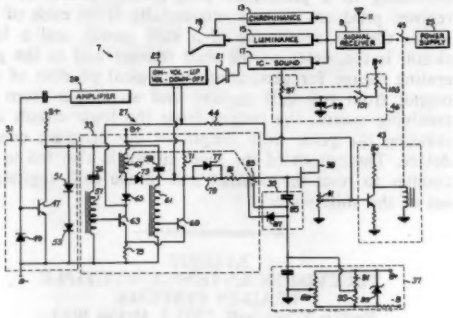
ELECTRONIC VOLUME AND ON/OFF CIRCUITS FOR REMOTE CONTROL SYSTEMS

Kenneth Leroy Boyd, Cheektowaga, and Silverio Antonio Valdes, Alexander, N.Y., assignors to GTE Sylvania Incorporated

Filed June 3, 1971, Ser. No. 149,571
Int. Cl. H04b 1/16
U.S. Cl. 325—392 **9 Claims**

In a remotely operable all electronic volume and on/off control circuit for a signal receiver having a sound channel for providing volume variations in response to variations in an alterable impedance wherein an insulated-gate FET-type (IGEFT semiconductor and an adjustable impedance are series connected intermediate the sound channel and a potential reference level with a memory means coupled to the semiconductor, a single relay up-down volume control means coupled to the memory means and

including first and second electron devices each responsive to a transmitted signal at a different frequency and a relay

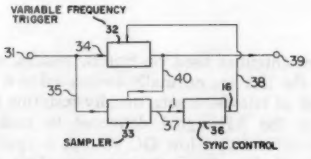


means for effecting increasing and decreasing volume of the sound channel and operation of the receiver.

3,713,029
TRIGGERING METHOD

Kozo Uchida, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1968, Ser. No. 773,611
Claims priority, application Japan, Nov. 9, 1967, 42/71,647, 42/71,648
Int. Cl. H03k *17/00*
U.S. Cl. 328—63 4 Claims



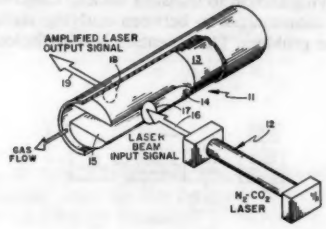
An improved triggering method used in a sampling device or a device requiring trigger input signals for realizing a faithful synchronization of an output signal with an input signal given to the aforementioned device. A variable of a sampler circuit such as voltage or current is automatically adjusted to a value which can bring the synchronization in a transfer of the input signal through the sampler.

3,713,030
APPARATUS FOR AND METHOD OF PROVIDING POPULATION INVERSION

Arthur R. Kantrowitz, Arlington, Edward T. Gerry, Boston, Donald A. Leonard, Stoneham, and Jack Wilson, Reading, Mass., assignors to Avco Corporation, Cincinnati, Ohio

Continuation of application Ser. No. 626,356, Feb. 16, 1967. This application Oct. 12, 1970, Ser. No. 80,152
Int. Cl. H01s *3/09*
U.S. Cl. 330—4.3 23 Claims

A method of and apparatus for producing a population inversion by expansion through a nozzle and into a chamber, a preferably hot equilibrium gas having various internal states which have different relaxation times, the relaxation times being sufficiently separated that the upper laser level relaxation time is long compared to the expansion time and the lower laser level relaxation time is short compared to the expansion time. The equilibrium gas is a mixture of a polyatomic laser gas having an upper laser level, a lower laser level and a ground state, and at least

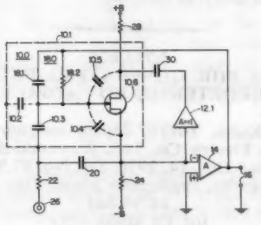


one auxiliary gas having a vibrational energy level resonant with the upper laser level of the laser gas. The auxiliary gas functions to increase the effective relaxation time of the upper laser level. The heated mixture may be supplied by transfer heating of the gas constituents or by direct combustion of suitable fuels.

3,713,031
BOOTSTRAPPED CHARGE-SENSITIVE LOW NOISE AMPLIFIER

Charles W. Williams, Knoxville, and Dale A. Gedcke, Oak Ridge, Tenn., assignors to Ortec, Incorporated, Oak Ridge, Tenn.

Filed Sept. 29, 1970, Ser. No. 76,349
Int. Cl. H03f *3/04;* H03k *3/00*
U.S. Cl. 330—16 5 Claims



When used with a capacitive transducer input, the overall noise figure of an amplifier system is significantly reduced by making use of the combined functions of bootstrapping and charge sensitivity of the input active device.

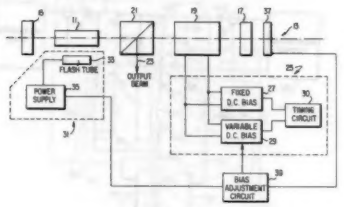
3,713,032
Q-SWITCHING LASER SYSTEM HAVING ELECTRONICALLY CONTROLLED OUTPUT COUPLING

John L. Wentz, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 1, 1970, Ser. No. 77,093
Int. Cl. H01s *3/11*
U.S. Cl. 331—94.5 7 Claims

A laser rod is optically aligned with a pair of totally reflecting mirrors forming an optical resonant cavity. A beam splitting polarizer and an electro-optical Q-switching cell are disposed along the optical axis of the cavity

between the rod and one mirror. The beam splitting polarizer directs a portion of the energy in the laser resonator out of the cavity. The portion of the energy which is extracted is dependent upon the induced birefringence of the electro-optical Q-switching cell, the latter being selectively controlled in accordance with a voltage applied to the cell. The cell functions to alter the linearly polarized light beam emitted by the laser to an elliptically polarized beam, the orthogonal component of which is



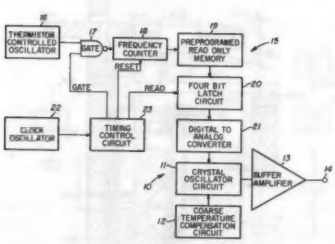
coupled from the resonator by the polarizer. In a hold-off mode, the laser rod is pumped but the Q-switching cell is activated to cause the polarizer to couple spontaneously emitted radiation from the cavity, preventing oscillation. In the pulse mode, the Q-switching cell is activated to effect feedback by the polarizer of sufficient energy to the laser rod to cause oscillations with a portion of the oscillating energy coupled out of the cavity by the polarizer. By electronic tuning of the Q-swtiching cell, optimum output coupling conditions are obtained.

3,713,033

DIGITALLY TEMPERATURE COMPENSATED OSCILLATOR

Marvin E. Frerking, Cedar Rapids, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed Sept. 1, 1971, Ser. No. 176,888
Int. Cl. H03b *5/36*
U.S. Cl. 331—116 R **11 Claims**



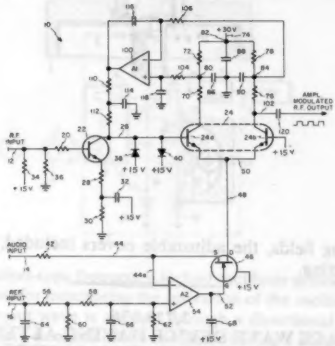
A system for digitally correcting the frequency of a crystal oscillator as a function of ambient temperature. Ambient temperature sensed is converted to digital data that is used to address a preprogrammed read only memory to determine the frequency correction factor required for the ambient temperature measured. The factor in the form of a digital frequency correction word is then converted to an analogue voltage and applied to a voltage responsive oscillator frequency varying device for correcting oscillator frequency.

3,713,034

AUDIO SIGNAL CONTROLLED AMPLITUDE MODULATION CIRCUIT OF SQUARE WAVE OUTPUT

Allan A. Schwartz, Orange, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Oct. 26, 1971, Ser. No. 192,120
Int. Cl. H03c *1/06*
U.S. Cl. 332—31 T **7 Claims**



Amplitude modulation of a radio frequency with minimum distortion and good linearity is accomplished by driving a squaring circuit of the alternately conducting two transistor type at the radio frequency while using the audio signal to control amplitude of the square wave output. Bridge and differential amplifier feedback means are used to assure 50% duty cycles for the squaring circuit transistors.

3,713,035

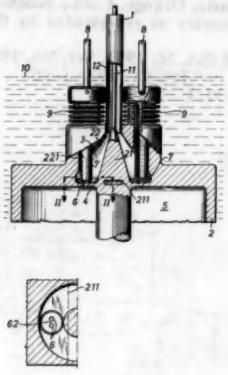
COUPLING SYSTEM WITH ADJUSTABLE COUPLING FACTOR FOR FEEDING HIGH FREQUENCY RESONATOR

Helmut Friedburg and Laszlo Szecsi, Karlsruhe, Germany, assignors to Gesellschaft fur Kernforschung mbH, Karlsruhe, Weberstrasse, Germany

Filed Feb. 23, 1971, Ser. No. 118,126
Claims priority, application Germany, Mar. 7, 1970, P 20 13 585.7
Int. Cl. H01p *5/04, 5/08*
U.S. Cl. 333—24 R **12 Claims**

A superconducting coupling system with a coupling head having an adjustable coupling factor and including a feed line which in one embodiment is conically expanded at its coupling end so as to form the coupling head. The feed line is short-circuited with a terminal plate, while the characteristic impedance remains constant. The terminal plate separates the electromagnetic field in the coupling head from that in a resonator to which it is connected. The terminal plate has coupling holes therein which are arranged in pairs and separated from each other by a ridge. The direction of the ridge determines the direction of the conduction current whose magnetic field penetrates through the coupling holes and, as a consequence of the direction of the ridge, is directed so that at least one component of the coupling field coincides with the required direction of the field in the resonator. The arrangement of the coupling holes in pairs has dipole characteristics. Hence, coupling is achieved mainly through a dipole field. The coupling holes can be covered in a predetermined way by means of adjustable covers. The quality factor, Q, of the unloaded resonator is largely

independent of the setting of the coupling elements, i.e., the coupling factor. All components in the range of the



coupling fields, the adjustable covers included, are superconducting.

3,713,036

SURFACE WAVE DEVICE HAVING ALTERNATING REMANENT POLARIZATION BETWEEN INTERDIGITAL ELECTRODES, SPACED A SURFACE WAVELENGTH APART

Helmut Thomann, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Apr. 26, 1971, Ser. No. 137,231
Claims priority, application Germany, Apr. 29, 1970, P 20 21 090.6
Int. Cl. H03h *7/30*; H01v *7/00*
U.S. Cl. 333—30 R **4 Claims**

A surface-wave acoustic device characterized by input and output transducers disposed on a surface of a piezoelectric ceramic substrate. Each of the transducers is of an interdigital type having a pair of comb-like electrodes each of which has prong or finger-like electrodes arranged with the fingers or prongs of one electrode disposed between the prongs or fingers of the other electrodes. The device is produced by applying a polarizing f'ld to the electrodes to cause the direction of remanent polarization to extend from prong to prong of the interengaged electrodes of each transducer. The distance of the prongs of the comb-like electrodes from each other is equal to one wave length of the acoustic surface wave.

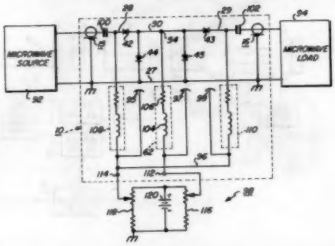
3,713,037

VARIABLE MICROWAVE ATTENUATOR

Samuel Hopfer, Brooklyn, N.Y., assignor to General Microwave Corporation

Continuation-in-part of application Ser. No. 788,254, Dec. 31, 1968. This application Oct. 7, 1970, Ser. No. 78,891
Int. Cl. H01p *1/22*
U.S. Cl. 333—81 A **17 Claims**

A broadband microwave attenuator is formed by connecting a plurality of PIN diodes in a modified T network. Four semiconductor chips of PIN diode material are arranged in a flat layer sandwiched between conductors to form a strip-line configuration of a TEM transmission line, whereby the diodes are part of the line. This strip-line construction is used with outer diodes connected in series circuit relation between input and output terminals, and inner diodes in shunt relation to ground to form the T network. The diodes are constructed as silicon chips and are mounted in very close relation with a substantially uniform conductive strip forming the series-circuit connection between the central diodes and of a length which is small compared to the wavelength at high



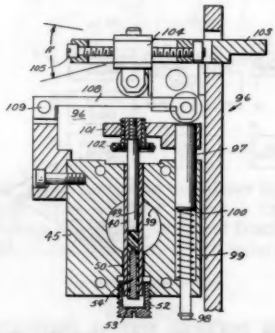
frequencies. Thereby, this connection is substantially lossless at low frequencies, and maintains the characteristic impedance of the line at high operating frequencies. Bias signals are supplied to the outer and inner diodes via conically spiral resistive conductors that form broadband, reflectionless, non-absorbing connections. The conical spiral conductor serves as a single-wire transmission line having a high impedance to high-frequency signals over a broad band carried by an r-f transmission line and serves as an effective coupling to such an r-f line.

3,713,038

MICROWAVE RECEIVER AND COMPONENT THEREFOR

James W. Crimmins, 28 Sharp Hill Road, Wilton, Conn. 06897, and Russell Pankey, Carrituck Road, Newtown, Conn. 06470

Filed Sept. 19, 1969, Ser. No. 860,851
Int. Cl. H01p *7/04, 5/04*; H03h *13/00*
U.S. Cl. 333—82 B **3 Claims**



A microwave receiver and front end unit including a preselector filter comprised of a plurality of directly coupled cylindrical cavities that are simultaneously tuned to the same frequency by noncontacting conducting elements mounted in the cavities, transverse to the longitudinal axes thereof. In addition, the front end unit includes a mixer circuit to which intercepted R.F. signals and local oscillator power are directly coupled.

3,713,039

TELEPHONE ANSWERING AND RECORDING DEVICE

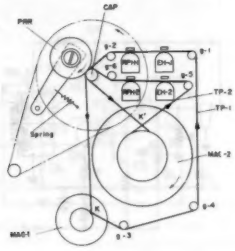
Kazuo Hashimoto, 28-2, 2-chome Komazawa, setagaya-ku, Tokyo, Japan

Filed Sept. 14, 1970, Ser. No. 71,645

Claims priority, application Japan, Sept. 27, 1969, 44/77302

Int. Cl. H04m 1/64

U.S. Cl. 179—6 R 7 Claims



Disclosed herein is an automatic telephone answering and recording device characterized by a novel and simplified mechanism wherein a single capstan and a single pinch roller are provided through which both the outgoing and incoming magnetic tapes transport, whereby the transport time of the incoming magnetic tape is controlled by one cycle of the outgoing magnetic tape, and a sign off message can be prerecorded near the end of the outgoing magnetic tape.

3,713,040

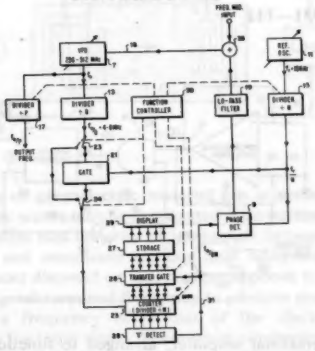
SIGNAL FREQUENCY CONTROLLER

John R. Page, Jr., Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 23, 1971, Ser. No. 211,546

Int. Cl. H03b 3/04

U.S. Cl. 331—1 A 6 Claims



An improved frequency generator includes digital circuitry contained within a phase lock loop to maintain accurate phase-locked frequency control at a frequency selected by the signal generator being controlled and to provide a stable digital readout of the generator output of the selected frequency.

3,713,041

INJECTION TYPE FREQUENCY LOCKED OSCILLATOR APPARATUS

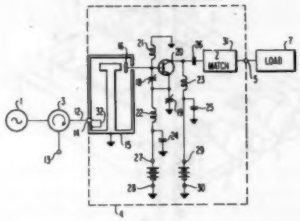
Kazuo Sakamoto, and Ryoji Tamura, both of Minato-ku, Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Dec. 14, 1971, Ser. No. 207,881

Claims priority, application Japan, Dec. 14, 1970, 45/110492

Int. Cl. H03b 3/06, 5/18, 7/14

U.S. Cl. 331—44 8 Claims



An injection-type frequency-locked oscillator provided with novel means for monitoring the operation of the oscillator. An injection input wave is applied through a directional coupler to an auxiliary terminal of the oscillator having a separate output terminal connected to a load. The coupler separates the injection input wave from the oscillator output wave. The output impedance of the oscillator is matched to the load impedance; however, the input impedance of the oscillator at the auxiliary terminal is mismatched to the output impedance of the coupler with respect to the injection input wave, thereby producing in the coupler a reflected injection input wave which is 180° out of phase with the oscillator output wave when the oscillator is frequency-locked at the center frequency of the injection input wave. The signal level at a monitoring terminal of the coupler provides a monitoring signal indicative of the degree of frequency-locking of the oscillator.

3,713,042

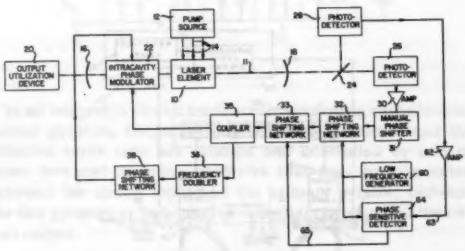
STABILIZED MODE-LOCKED LASER ARRANGEMENT

Tracy Stewart Kinsel, Martinsville, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed May 27, 1971, Ser. No. 147,328

Int. Cl. H01s 3/10

U.S. Cl. 331—94.5 9 Claims



A dither technique is embodied in an auxiliary feedback loop of a mode-locked laser which includes a main feedback loop. An error-control signal is generated in the auxiliary loop in response to the occurrence in the laser system of various types of perturbations such as, for example, cavity length changes. This error signal is applied to the main loop to restore the operating point of the laser to the midpoint of the range in which mode-locked operation occurs. In this way the laser is positively controlled to exhibit a stable mode-locked behavior over a long period of time despite the occurrence of perturbations that might otherwise cause the operating point of the laser to extend outside the mode-locked range.

3,713,043

GAS LASERS WITH ELECTRICALLY-CONDUCTIVE PLASMA TUBE

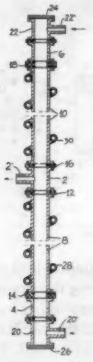
Pinchas Avivi, and Felix Dothan, both of Jerusalem, Israel, assignors to Yissum Research Development Company of the Hebrew University, Jerusalem, Israel

Filed Dec. 7, 1970, Ser. No. 95,722

Claims priority, application Israel, Dec. 19, 1969, 33568; Oct. 26, 1970, 35538

Int. Cl. H01s 3/02

U.S. Cl. 331—94.5 9 Claims



Gas lasers are described in which the tube is of metal. In one embodiment, the tube is of metal for substantially the complete axial length thereof between the electrodes, the tube being insulated from and at a floating electrical potential with respect to the electrodes. In a second described embodiment, the tube is made of a plurality of metal sections each being of optimum length to provide optimum electron temperature for maximum power output and being insulated from the other sections and from the electrodes.

3,713,044

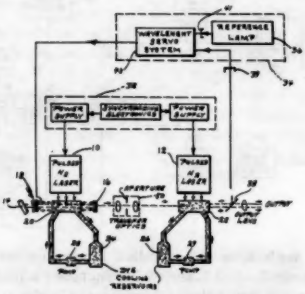
N_2 PUMPED TUNABLE DYE LASER

Irving Itzkan, Boston, Mass., assignor to The United States of America as represented by the Secretary of the Air Force

Filed May 17, 1972, Ser. No. 254,137

Int. Cl. H01s 3/20

U.S. Cl. 331—94.5 3 Claims



An N_2 pumped tunable dye laser apparatus having an oscillator dye cell located within an optical cavity comprising a grating in a Littrow configuration and a mirror. A second pulsed laser pumps an amplifier dye cell which is not surrounded by any optical cavity. The oscillator dye cell and the amplifier dye are aligned and synchronized so that the amplifier cell will reproduce the photon output of the oscillator dye cell in both frequency and transverse phase.

3,713,045

OSCILLATOR WITH A PIEZO-MECHANICAL VIBRATOR

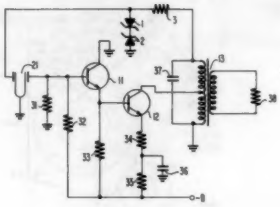
Shogo Usuda, Yokohama; Kazuo Hamazato, Tokyo; Kiyoshi Uehara, and Hisashi Uchida, both of Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nippon Electric Company Limited, Toky-to, Japan, part interest to each

Filed June 2, 1971, Ser. No. 149,289

Claims priority, application Japan, June 3, 1970, 45/48256

Int. Cl. H03b 3/02, 5/30, 5/36

U.S. Cl. 331—109 6 Claims



Improved oscillator including an oscillator element, amplifier, amplitude limiter and tuned output circuit. A feedback path is provided between the tuned output circuit and the oscillator element. The amplitude limiter is connected between the amplifier and the tuned circuit to provide a constant amplitude signal to the tuned output circuit notwithstanding variations in the output from the amplifier caused by variation in the ambient temperature and aging. Further, by providing a resistance between the amplitude limiter circuit and the tuned circuit the resonance Q of the tuned circuit can be made high without producing an adverse effect on the amplitude limiter circuit.

3,713,046

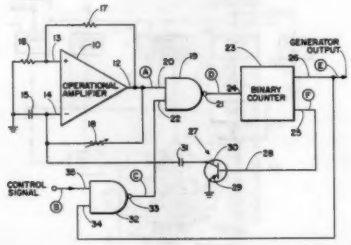
WAVEFORM GENERATOR WITH ACCURATE MARK TO SPACE RATIO

Cho Lun Wong, Ottawa, Ontario; Glenson Trevelyn Jones, Kanata, Ontario; and Roland Francis Crawford, Ottawa, Ontario, all of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Feb. 22, 1972, Ser. No. 228,194

Int. Cl. H03k 3/282

U.S. Cl. 331—111 5 Claims



An operational amplifier, arranged to function as a free running rectangular waveform oscillator is coupled to a binary counter via an electronic gate. A transistor switch, which is controlled by one output of the binary counter, is used to alternately change the period of successive cycles generated by the rectangular waveform oscillator. When the electronic gate is enabled a waveform is generated at the output of the binary counter with a mark-to-space ratio dependent on the ratio of the alternate periods of the rectangular waveform oscillator.

3,713,047

OSCILLATOR WITH ELECTRODYNAMIC DRIVE AND ELECTROMAGNETIC DETECTION, ESPECIALLY FOR USE IN AN ELECTRONIC CLOCK

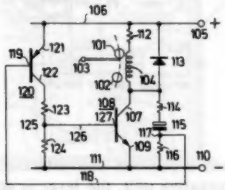
Edmund Ketterer, Blumberg, Black Forest, Germany, assignors to Firma S. L. Kroewerath & Co., Blumberg-Schwarzwald, Germany

Filed Dec. 7, 1970, Ser. No. 95,661

Claims priority, application Germany, Dec. 9, 1969, P 19 61 629.6

Int. Cl. G04c *3/04*; H02k *33/18*; H03b *5/30*

U.S. Cl. 331—116 M 12 Claims



An oscillator of the swinging-mass type, especially for use in an electronic clockwork wherein an amplifier feedback circuit is provided between a pickup coil and a drive coil electromagnetically coupled with the swinging mass. The swinging mass is formed with a pair of oppositely poled permanent magnets spaced apart by a distance less than the magnetic cross-section of the coil means constituting the pickup and drive coils.

3,713,048

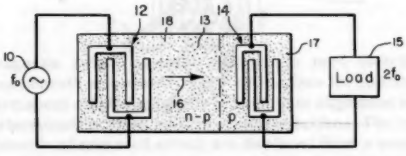
SWIF'S WITH SPECIAL POLARIZATION FOR NON-LINEAR INTERACTIONS

Fleming Dias, Palo Alto, Calif., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed July 28, 1971, Ser. No. 166,794

Int. Cl. H03c *1/46*; H03f *7/00*; H02m *5/06*

U.S. Cl. 332—52 18 Claims



A medium of piezoelectric material has a surface upon which acoustic waves may be propagated. One portion of that medium exhibits non-linearity of interaction between stress components and associated electric field components. An input transducer disposed on that portion responds to an electric signal of predetermined frequency to produce stress components at a frequency twice that of the electric field developed by the input signal. These stress components result in acoustic energy which propagates as a surface wave of twice the input signal frequency. Finally, an output transducer is coupled to a linearly interacting portion of the medium and responds to the acoustic energy for developing an output signal. Without more, the device may function as a frequency doubler. With the addition of further apparatus to couple another input signal to the medium, the device may function as a modulator or other apparatus in which two signals co-act.

3,713,049

SYSTEM FOR DEFLECTING MAGNETIC WAVES UTILIZING A FERRIMAGNETIC PLATE

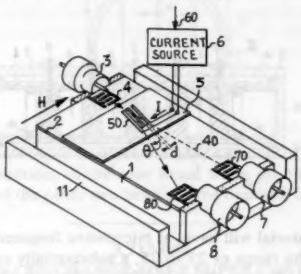
Bernard Desormiere, Paris, France, assignor to Thomson-CSF, Paris, France

Filed June 1, 1971, Ser. No. 148,445

Claims priority, application France, June 3, 1970, 7020371

Int. Cl. H01p *1/10*

U.S. Cl. 333—7 6 Claims



The present invention relates to a device for deflecting magnetic waves.

According to the invention, there is provided a system comprising a plate of ferrimagnetic material polarized by a magnetic field H, wherein magnetic waves are excited. An arrangement constituted by a serpentine wire conductor lying on an insulating plate, periodically modulates the magnetic polarizing field in a zone underlying said arrangement, the latter induces a diffraction grating disposed in such a way that the magnetic waves arrive on it at the BRAGG angle. A controllable current source 6 supplies the wire conductor.

3,713,050

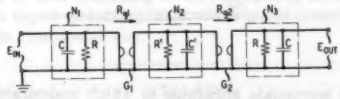
INTEGRATED CIRCUIT TRANSFORMERS EMPLOYING GYRATORS

John Joseph Golembeski, New Providence, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed May 11, 1971, Ser. No. 142,181

Int. Cl. H03h *7/44*

U.S. Cl. 333—24 R 2 Claims



In an integrable circuit transformer employing cascade-connected gyrators, frequency response characteristics and the effective turns ratio are tailored and controlled by one or more two-port coupling networks that may be connected between the circuit input and the primary gyrator, between the two gyrators or between the secondary gyrator and the circuit output.

3,713,051

MICROWAVE DEVICES

Robert Christopher Kell, South Harrow, England, assignor to The General Electric Company Limited, London, England

Filed Nov. 18, 1970, Ser. No. 90,655

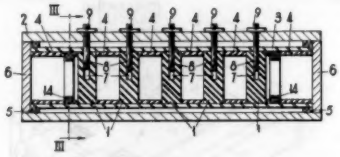
Claims priority, application Great Britain, Dec. 11, 1969, 60,579/69

Int. Cl. H01p *3/08*, *7/06*; H03h *7/08*

U.S. Cl. 333—73 R 4 Claims

In a microwave device incorporating a component formed of dielectric material, and so designed that the response of the

device is dependent on the permittivity of the said material, the component is formed of a ceramic material consisting of one or more alkaline earth metal zirconates, or zirconates and titanates, together with niobium pentoxide and/or tantalum pentoxide, the composition of the material being such that the atomic ratio of zirconium to titanium is not less than 80 : 20, that the total proportion of niobium pentoxide/tantalum pentoxide is in the range of 0.1 to 3.0 mole per cent of the total amount of the zirconate/titanate constituent, that it does not contain more than 10 mole per cent of barium titanate, and



that the material will have, at microwave frequencies, permittivities in the range of 25 to 75, a substantially constant temperature coefficient of permittivity, which is preferably within the range from +50 to −100 p.p.m. per degree Centigrade, and a loss tangent not exceeding 0.001 at 20°C. The dielectric materials are advantageous for use, for example, as resonators for microwave bandpass filters, and as substrates for microwave integrated circuits. In the cases of some of the materials, the inclusion of niobium pentoxide/tantalum pentoxide reduces the microwave losses, as compared with similar materials without such additions.

3,713,052

LEAKY WAVEGUIDE LINE

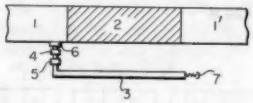
Hiroshi Kitani; Kenichi Yoshida; Hideo Ohtsubo, and Masataka Kuroda, all of Osaka, Japan, assignors to Sumitamo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 23, 1970, Ser. No. 100,937

Claims priority, application Japan, Dec. 25, 1969, 45/1632

Int. Cl. H01q *13/00;* **H04b** *7/00, 3/60*

U.S. Cl. 333—84 R **7 Claims**



A leaky waveguide apparatus in which undesirable transmission modes caused by irregularities in the waveguide are eliminated. In one embodiment the unwanted transmission modes are eliminated by a section of helical waveguide, and power is extracted from the leaky waveguide by a converter, phase shifter, and auxiliary leaky waveguide. In another embodiment, the unwanted transmission modes are eliminated by tapered tube means and a directional coupler. The power is extracted from the leaky waveguide through the directional coupler, a phase shifter, and an auxiliary leaky waveguide.

3,713,053

RESET TIMER

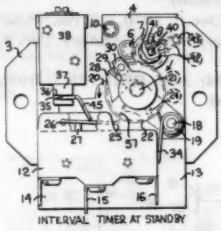
Joseph J. Mahon, Wauwatosa, Wis., assignor to Deltrol Corp., Bellwood, Ill.

Filed Oct. 18, 1971, Ser. No. 190,247

Int. Cl. H01h *43/00*

U.S. Cl. 335—75 **10 Claims**

A spring return type timer in which a timing gear is bodily carried by a solenoid operated lever which shifts it into and out of mesh with a motor driven pinion. This shiftable timing gear directly actuates a snap switch. The lever carries a field removable tab which holds the switch in actuated position when the lever releases the clutch, and releases the switch to control by the timer when the clutch is engaged. The tab when used causes the timer to serve as an interval timer. Removal of



the tab from active position converts the timer to a delay timer. In an alternative unit, the lever is actuated by a push button. Here the lever tab serves to prevent start of a cycle until the push button is released.

3,713,054

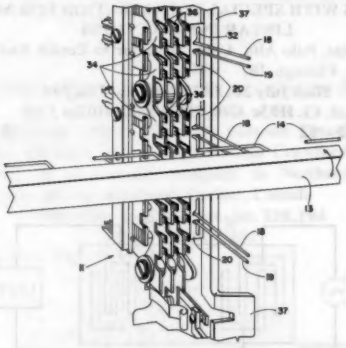
CROSSBAR SWITCHES

Gilbert Leslie Elliott, Georgetown, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed March 10, 1972, Ser. No. 233,617

Int. Cl. H01h *67/26*

U.S. Cl. 335—112 **3 Claims**



The select fingers in a crossbar switch has a movable lever arm which enables at least a reduction in the different operating forces which occur when a select finger is actuated in a free condition as compared to when a select finger is operated in a trapped condition —that is when held by an operating card.

3,713,055

AUXILIARY CONTACT SYSTEM FOR ELECTROMAGNETIC SWITCHING DEVICES

Werner B. Halbeck, Cedarburg, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

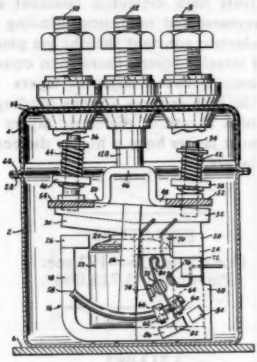
Filed June 25, 1971, Ser. No. 156,681

Int. Cl. H01h *3/48*

U.S. Cl. 335—136 **5 Claims**

A contact sequencing arrangement accomplished by a lost motion drive connection between the armature and the aux-

iliary contact system in conjunction with a permanent magnet detent system for the movable member of the auxiliary con-



tact system wherein the main contacts of the relay make before the auxiliary contacts make and break before the auxiliary contacts break.

3,713,056

ELECTROMAGNETIC SWITCH ASSEMBLY

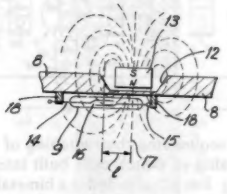
Minoru Hosokawa, Suwa-shi, Nagano-ken, Japan, assignor to Kabushiki Kaisha Surva Seikosha, Tokyo, Japan

Filed Nov. 15, 1971, Ser. No. 198,783

Claims priority, application Japan, Nov. 16, 1970, 45/113461; Nov. 17, 1970, 45/113531

Int. Cl. H01h *41/08*

U.S. Cl. 335—206 **7 Claims**



A magnetic switch assembly wherein a reed switch is mounted beneath an operative keyboard surface for operation by a permanent magnet manually brought into alignment with a predetermined location on said operative surface. The contact elements of said reed switch are displaced from a normal axis passing through said predetermined location in the path of the lines of magnetic force of said permanent magnet. A matrix of said predetermined locations may be provided on said operative keyboard surface, a reed switch being aligned with a diagonal passing through each intersection of said matrix.

3,713,057

APPARATUS FOR LATERALLY CORRECTING THE POSITION OF THE BLUE BEAM IN A CRT

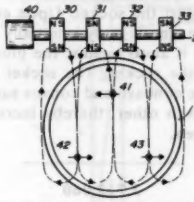
Arthur J. Lostumo, Franklin Park, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 14, 1972, Ser. No. 217,807

Int. Cl. H01f *1/00*

U.S. Cl. 335—212 **6 Claims**

A plurality of magnetic rubber disks each axially magnetized to form a first magnet in a first portion and a second magnet in a second portion diametrically opposed to the first portion and with the poles positioned oppositely. The disks are axially aligned on a common spindle, with adjacent poles being similar, and the spindle is rotatably mounted adjacent the neck of a multi-beam cathode ray tube. The magnetized



disks are mounted to produce variable amounts of movement, in either direction, of the blue beam while producing lateral movement of the other two beams in the opposite direction.

3,713,058

CONTROLLED CHANGE-OVER SUPER CONDUCTIVE SWITCH

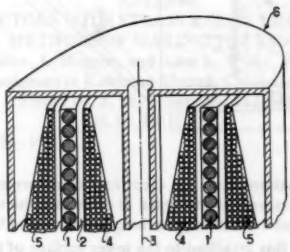
Enrique Santa-Maria, Villiers-sur-Orge, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Jan. 6, 1972, Ser. No. 215,717

Claims priority, application France, Jan. 7, 1971, 7100377

Int. Cl. H01f *7/22*

U.S. Cl. 335—216 **4 Claims**



A device obtains resistance response curves of a switch as a function of time according to laws defined in advance, comprising a superconducting main winding and control windings wound in a particular way.

3,713,059

SOLENOID OPERATED PLUNGER DEVICE

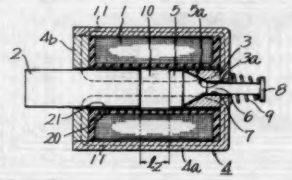
Kiichiro Tada, Osaka, Japan, assignor to Hoshidenki-Seizo Kabushiki-Kaisha, Osaka-fu, Japan

Filed Dec. 1, 1971, Ser. No. 203,653

Claims priority, application Japan, Dec. 5, 1970, 45/121838

Int. Cl. H01f *7/08*

U.S. Cl. 335—259 **3 Claims**



A solenoid operated plunger device is provided of the type in which a plunger is arranged to be forced by magnetic attraction into a coil upon energization thereof. Movably interposed between the plunger and a socket therefor is an auxiliary mag-

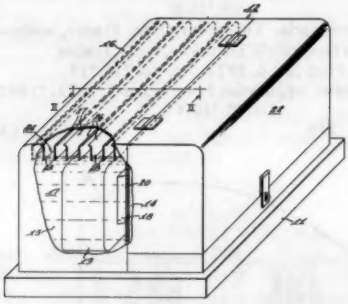
netic body. A guide rod of magnetic material attached to one end of the auxiliary magnetic body extends through the socket to the exterior thereof, and a spring engages the externally projecting part, the spring urging the auxiliary magnetic body against the socket. Upon energization of the coil, the auxiliary magnetic body against the socket. Upon energization of the coil, the auxiliary magnetic body is initially driven toward the plunger, and when it abuts against the plunger, both are integrally driven to the socket. The socket and the auxiliary magnetic body have concave and convex surfaces, respectively, which can fit each other, thereby increasing the area of contact therebetween.

3,713,060

TRANSFORMER HAVING IMPROVED HEAT DISSIPATING SYSTEM

James H. Harlow, Gadsden, Ala., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 12, 1971, Ser. No. 171,296
Int. Cl. H01f 27/08
U.S. Cl. 336—58 **4 Claims**



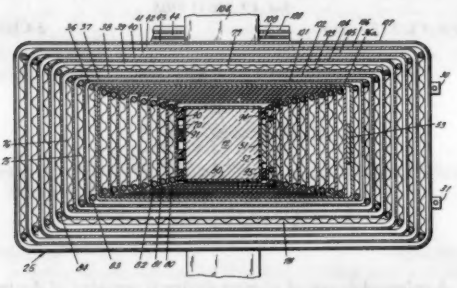
Heat dissipation from an electrical transformer having a core and coil assembly immersed in oil within the transformer casing and a gas cushion above the oil is increased by a plurality of metallic fins attached to the inner surface of the metallic cover which depend through the gas cushion with their ends immersed in the oil and augment the amount of heat transmitted from the hot oil through the gas cushion to the cover.

3,713,061

INSULATION STRUCTURE TRANSFORMER WINDINGS

Hans J. Weber, Cornwells Heights, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed March 24, 1972, Ser. No. 237,714
Int. Cl. H01f 15/14, 27/32
U.S. Cl. 336—70 **9 Claims**



Corrugated spacers are disposed between winding layers of a transformer winding to enable circulation of air between the layers. Elongated reinforcing rods are placed in corrugations at the corner regions of the winding and adjacent wedges between the winding and the transformer core. Dielectric sheaths of relatively high dielectric constant are disposed between the outermost and innermost winding layers while relatively low dielectric constant sheaths are placed between adjacent pairs of interior layers, thereby to equalize the distributed capacitance between adjacent layers. A dielectric barrier between the high and low voltage windings of a transformer consists of a sheath of dielectric layers wherein the inner and outermost layers have a higher dielectric constant than the interior layers.

ERRATUM

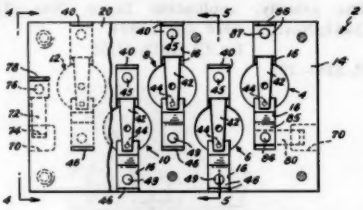
For Class 336—192 see:
Patent No. 3,713,066

3,713,062

SNAP DISC THERMAL SEQUENCER

Stuart L. Butler, Versailles, Ky., and Robert E. Crocker, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1970, Ser. No. 102,472
Int. Cl. H01h 71/16
U.S. Cl. 337—107 **13 Claims**



Apparatus for sequencing the switching of electrical loads comprises a plurality of switch cells built into an electrically insulating housing. Each cell includes a bimetallic disc, motion transfer pin, switch and terminal members. A disc plate is located adjacent one side of the discs to retain them in position while a control heater is positioned contiguous to the disc plate with suitable electrical insulation interposed therebetween. A heater grid cover and a terminal cover are located on opposite sides of the housing to complete the assembly. The control heater can take different forms including a printed heater on a ceramic substrate or a semiconductive steep sloped positive temperature coefficient of resistance (PTC) material and can be formed as individual heater elements on a common heat sink. Line voltage compensation, as by zener regulators, can also be provided.

3,713,063

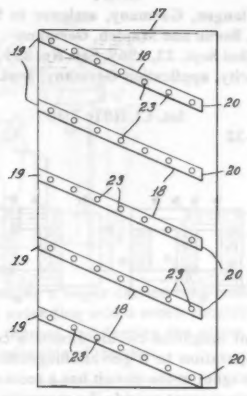
METHOD OF AND MEANS FOR MAKING A CURRENT LIMITING FUSE

John F. Foulkes, Elmhurst, Ill., assignor to S. & C. Electric Company, Chicago, Ill.

Filed March 13, 1972, Ser. No. 234,203
Int. Cl. H01h 85/14
U.S. Cl. 337—159 **14 Claims**

A rectangular sheet of flexible insulation has metallic ribbons diagonally disposed thereon with the ends of adjacent

ribbons aligned for juxtaposition when the sheet is formed into a cylinder and the ribbons form a helical fusible element for interconnecting end terminals of an enclosing insulating fuse housing.



3,713,064

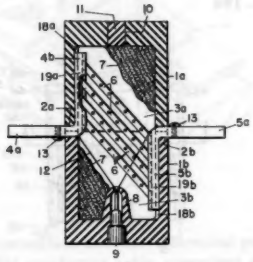
CURRENT-LIMITING POLYPHASE FUSE

Philip C. Jacobs, Jr., Newtonville, Mass., assignor to The Chase-Shawmont Company, Newburyport, Mass.

Filed Nov. 3, 1971, Ser. No. 195,405

Int. Cl. H01h *85/12*

U.S. Cl. 337—161 **6 Claims**



An electric fuse has a substantially prismatic housing or casing formed by a pair of complementary hood-shaped half-shells. An L-shaped terminal bar is affixed to each of the half-shells. Each terminal bar includes an external portion and an internal portion. The internal portions of the terminal bars extend in opposite directions each into one of said pair of half-shells and are conductively interconnected by fusible elements extending from one of the pair of half-shells into the other of the pair of half-shells.

3,713,065

FAST-ACTING ELECTRICAL FUSE

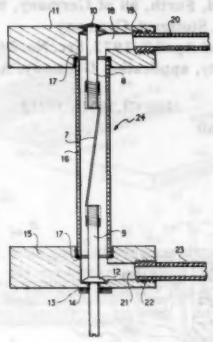
Francis Jules Brichant, Belfort, France, assignor to Lucien Ferraz et Cie, Lyon, France

Filed June 12, 1970, Ser. No. 45,648

Int. Cl. H01h *85/04*

U.S. Cl. 337—166 **1 Claim**

A fast-acting electrical fuse in which the fusible element is in direct contact with a cooling liquid, there being means for directing cooling liquid under pressure upon the fusible element. In one preferred manner of use of the fuse of the invention, the liquid cooling system for the fuse is connected in series with the fuse, whereby failure of the cooling system for the circuit element causes a failure of the cooling system for the fuse and thus the opening of the circuit by the melting of the fusible element.



3,713,066

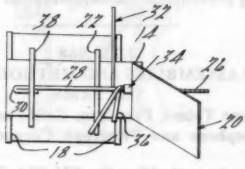
INDUCTORS WITH STRAIN RELIEF LEADS AND METHODS OF MAKING THE SAME

John L. Fisher, Lexington, and Alan L. Wilks, Versailles, both of Ky., assignors to Kuhlman Electric Company, Troy, Mich.

Filed Feb. 2, 1971, Ser. No. 111,849

Int. Cl. H01f *15/10*

U.S. Cl. 336—192 **24 Claims**



This invention relates to methods and apparatus for connecting coil leads to coil winding conductors and for protecting the winding conductors from damage due to strain placed on the lead conductors which are particularly well suited for use with transformers and the like utilizing soft wires such as aluminum. In an exemplary form of the invention, an insulation pad having an opening for entry of the lead conductor is folded about a connector which electrically connects the conductors. The ends of the folded pad are captured within the coil so that the fold and connector are positioned outside of the coil. Abutment of the connector on the pad at the fold provides an external strain relief. The external strain relief is supplemented by an internal strain relief provided by capturing an end portion of the lead conductor within the interior of the coil. The folded pad limits bending of the connector assembly so as to enhance the durability of the connection. Additional pads may be provided which surround the folded pad to further reinforce the connector assembly and to provide additional high voltage insulation. The lead connecting methods and constructions of this invention may be used for start, end or finish, and tap lead conductors.

3,713,067

TEMPERATURE-RESPONSIVE SWITCH

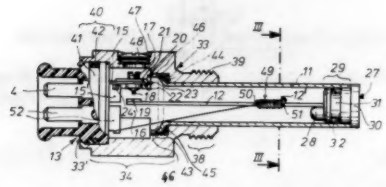
Klaus Gressenich, Hans Oppl, both of Ansbach; Berthold Walter, Unterasbach; Hans Weismann, Stuttgart, and Hartmut Zobl, Furth, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed April 7, 1972, Ser. No. 242,161

Claims priority, application Germany, April 8, 1971, P 21 17 323.9

Int. Cl. H01h 37/12

U.S. Cl. 337—360 16 Claims



A tubular housing is provided in one of its open ends with an electrically conductive carrier, a circular projection of which extends towards the other end of the housing. At the other end there is located a socket member of electrically insulating material, having one or more exterior terminals and a carrier portion located in the interior and exposed at the other open end of the housing. The carrier portion carries an adjusting screw which can be threadedly moved transversely of the elongation of the housing and carries at its free end a contact, and a second contact is carried at the free end of an elongated bimetallic strip which extends longitudinally within the housing and is mounted with one end on the projection of the carrier by being welded thereto. A U-shaped spring of spring wire is also mounted on the contact carrier and has portions engaging in the screwthreads of the adjusting screw so that the same is frictionally prevented from unintentional turning.

3,713,068

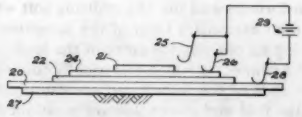
BONDED ASSEMBLIES AND METHODS OF MAKING THE SAME

Robert Eugene Talmo, Pasadena, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 871,894, Oct. 28, 1969. This application June 7, 1971, Ser. No. 150,502

Int. Cl. G01l 1/22

U.S. Cl. 338—2 3 Claims



A transducer assembly including a laminate of a silicon strain gauge and a nickel steel cantilever beam bonded together with a sheet of glass of a critical thickness. The method of the invention includes the step of applying a DC voltage across the joints to be bonded during a heating step. Improved bonds are obtained by the use of field distributing auxiliary glass. The use of a P-N junction type silicon strain gauge also improves the bond and avoids warpage.

3,713,069

CONTACT-FREE ELECTRICAL PULSE GENERATOR UTILIZING GALVANOMAGNETIC SEMICONDUCTOR BODY

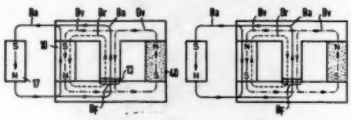
Paul Hini, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 22, 1969, Ser. No. 859,890

Claims priority, application Germany, Sept. 27, 1968, P 17 62 942.4

Int. Cl. H01c 7/16

U.S. Cl. 338—32 17 Claims



A permanent magnetic circuit directs a control magnetic field during operation to a galvanomagnetic semiconductor body. A first magnet in the circuit has a rectangular hysteresis loop. An outside magnet outside the magnetic circuit provides a magnetic field for abruptly switching the first magnet from one remanent state to the other whereby the total magnetic induction which results at the semiconductor body changes abruptly from one magnitude to another. A second magnet is connected in the magnetic circuit in magnetic parallel with the first magnet relative to the semiconductor body.

3,713,070

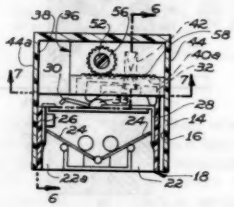
ROTARY ACTUATOR FOR A SWITCH

Edward V. Sahrbacker, Brecksville, Ohio, assignor to Lucerne Products, Inc., Hudson, Ohio

Filed May 3, 1971, Ser. No. 139,384

Int. Cl. H01c 9/08

U.S. Cl. 338—198 18 Claims



A rotatable actuator means for an electric switch in which the switch includes spaced stationary contact means and bridging contact means for movement into electrical conducting relation with respect to the spaced stationary contact means. The switch may include rheostat means disposed in circuit with the stationary contact means for speed control, with the rheostat means being selectively movable with the bridging contact means by the rotary actuator means, for providing a plurality of resistance values as determined by the position of the rotatable actuator means.

3,713,071

MOUNTING STRAP FOR GROUNDING ELECTRICAL DEVICES

John M. Poliak, East Meadow, and Juan M. Lopez, Elmhurst, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Brooklyn, N.Y.

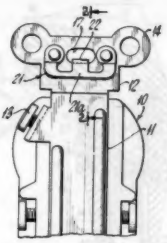
Filed April 21, 1971, Ser. No. 135,902

Int. Cl. H01r 3/06

U.S. Cl. 339—14 R 4 Claims

A mounting strap for supporting a wiring device in a metal wall box and establishing an electrical connection between a

metal mounting screw and the strap. Said screw forming a ground connection when the screw threadably engages with the metal wall box. The connection between the strap and



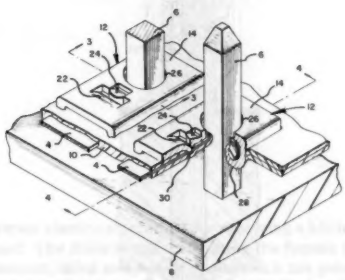
screw is established by a finger carried by a resilient member having a free end extending into a screw receiving slot in the strap at one side thereof and forcing the screw into engagement with an opposite side of the slot.

3,713,072

ELECTRICAL CONNECTIONS TO FLAT CONDUCTOR CABLE

Homer Ernst Henschen, Carlisle, and Clifton Wesley Huffnagle, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 30, 1971, Ser. No. 185,003
Int. Cl. H01r *11/08, 11/20;* H05k *1/02*
U.S. Cl. 339—17 F **9 Claims**



An electrical connection between a terminal post and a flat conductor in a flat conductor cable comprises a connecting member disposed on the cable in parallel relationship to the conductor. The connecting member, which is crimped through the cable and onto the conductor, has an opening through which the terminal post extends. Electrical contact between the post and the connecting member is achieved by curled portions of the connecting member and/or portions of the flat conductor which are in engagement with the terminal post.

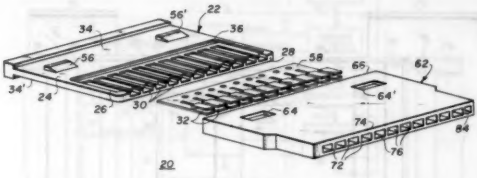
3,713,073

ELECTRICAL CONNECTOR

Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Jan. 11, 1971, Ser. No. 105,326
Int. Cl. H01r *13/58*
U.S. Cl. 339—17 F **12 Claims**

An improved electrical connector for flat cable comprising a selectively segmented relatively flat housing, an appropriately contoured base member releasably securable therewithin, and a plurality of terminating members positionable within associated spaced recesses longitudinally disposed adjacent one edge of the base member. Extending within the base member and terminating in an elongated opening adjacent the spaced recesses therein is a narrow slot-like cable receiving passage through which may be fed the terminating end of a flat cable, each of the bared conductor ends of which may then be bonded to an associated terminating member. Strain relief



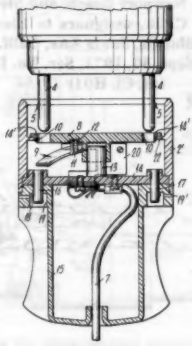
means extending at least partially into said passage may be provided to secure the cable therewithin. Complementarily contoured portions on the base member and housing, respectively, permit releasable, locking interengagement therebetween.

3,713,074

DETACHABLE CONNECTION FOR ELECTRICAL CONTACTS OF A PLUG AND SOCKET

Max Pasbrig, Casa Luce - Via Eco, 6644 Orselina/Ticino, Switzerland

Filed Feb. 1, 1971, Ser. No. 111,520
Int. Cl. H01r *13/54, 13/62, 13/64*
U.S. Cl. 339—41 **6 Claims**



A detachable connection for electrical contacts of a plug and socket arrangement which incorporates means for securing the electrical contacts against undesired or unintentional release, especially in the presence of traction forces, and that additionally means are provided by virtue of which the electrical contacts are covered towards the outside and safeguarded against unintentionally being contacted.

3,713,075

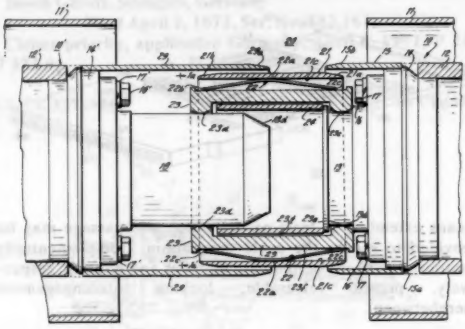
DIELECTRIC SHIELD FOR PLUG-IN CONTACTS

Robert M. Clark, Ligonier, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed April 26, 1971, Ser. No. 137,322
Int. Cl. H01r *13/62*
U.S. Cl. 339—64 R **9 Claims**

Inner conductors of isolated phase bus sections arranged end-to-end are adapted to experience movement relative to one another due to normal expansion and contraction thereof by virtue of a dielectric shielding assembly in which a multiplicity of contact fingers are biased against one end of one of the central conductors so as to ride in a groove provided therefor while being biased against the end of the next ad-

jacent conductor so as to make slidable contact engagement therewith. A dielectric shield surrounds both the ends of the conductors and the multiplicity of contact fingers and supports biasing members for urging the contact fingers and the



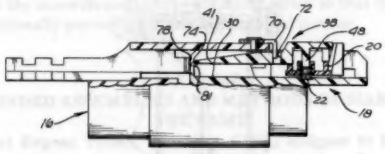
central conductor members into intimate electrical contact while at the same time serving the dual function of providing a dielectric shield to reduce electrical stresses which occur due to the contraction and expansion of the central conductors.

3,713,076

LOCKING ELECTRICAL CABLE CONNECTION APPARATUS

Henry Gabrielian, Newport Beach, and Steve Csaszar, Garden Grove, both of Calif., assignors to Electronic Engineering Company of California, Santa Ana, Calif.

Filed Sept. 30, 1971, Ser. No. 185,011
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 R **10 Claims**



A plug-receptacle electrical connector is disclosed incorporating a positive-engagement coupling with a locking apparatus. The plug includes a body with an integral transversely-extending strap which is folded to a hinging position along a surface of the body to receive a latch bar on the receptacle, for a positive engagement. A coil helper spring is mounted under the hinge strap, for maintaining engagement with the latch bar and additionally to support a locking cam which may be rotated to lock the hinge strap in a raised position of engagement with the latch bar.

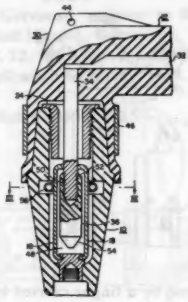
3,713,077

QUICK MAKE AND BREAK PLUG-IN CONNECTOR FOR A HIGH VOLTAGE AND HIGH CURRENT CIRCUIT

Merrill G. Leonard, Fowler, Ohio, assignor to Westinghouse Electric Corporation, Pittsburg, Pa.

Division of Ser. No. 774,908, Nov. 12, 1968, abandoned. This application Dec. 22, 1970, Ser. No. 100,677
Int. Cl. H01r *13/52*
U.S. Cl. 339—111 **5 Claims**

A connector for a high voltage and high current circuits comprising a stationary contact member and a plug-in contact member with means for causing said plug-in contact member to quickly engage or disengage said stationary contact



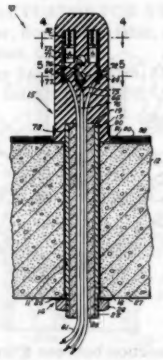
member in making or breaking the circuit comprising said fixed and plug-in contact members.

3,713,078

ELECTRIC OUTLET AND LEAD-THROUGH DEVICE

Oliver W. Majors, 326 Cape May, Corpus Christi, Tex.

Filed Nov. 27, 1970, Ser. No. 93,105
Int. Cl. H01r *13/40*
U.S. Cl. 339—130 C **5 Claims**



An electric outlet assembly comprising an insulator body having two sets of electric contacts for engaging the prongs of electric plugs and a lead-through assembly having a tubular member which extends through a building structure such as a wall or floor, the insulator body being convertible to one end of the tubular member and the conductors from the contacts extending through the tubular member from one side of the floor or wall to the other, the tubular member being closed by a fire resistant substance about the conductors.

3,713,079

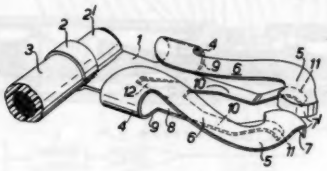
16 APC EDGE CONNECTOR

Helen Dechelette, Saint Cloud, France, assignor to AMP Incorporated, Harrisburg, Pa.

Filed April 30, 1971, Ser. No. 139,125
Int. Cl. H01r *9/08*
U.S. Cl. 339—217 R **5 Claims**

This invention comprises a spring sheet metal contact element for a printed circuit edge connector having a base plate from which extends a substantially flat cantilever contact arm with its plane substantially parallel to the base plate and hav-

ing a contact portion for resilient engagement with a printed circuit panel, the arm being supported in spaced relationship



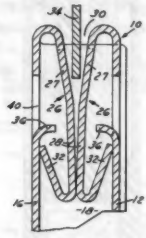
to the base plate by a U-shaped bight allowing resilient displacement of the arm in its own plane by the printed circuit panel.

3,713,080

ELECTRICAL TERMINAL

Robert D. Kennedy, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 20, 1971, Ser. No. 181,923
Int. Cl. H01r *13/12*
U.S. Cl. 339—258 R **9 Claims**



A female electrical terminal for receiving a blade terminal is disclosed. The main elements forming the female terminal are first, second, third and fourth walls which are joined together into an integral unit at edges between the first and the second, the second and the third, and the third and the fourth walls. A cooperable lock device is formed, in part, on a free end of the first wall and, in part, on a free end of the fourth wall. The cooperable lock device locks the walls into a closed configuration to define therein an interior volume in which the first and the third walls are in facing relationship and the second and the fourth walls are in a facing relationship. Individual ones of a pair of terminal elements are formed integrally from respective ones of a pair of facing walls. Each of the terminal elements is folded back from its point of attachment to the wall into the interior volume of the terminal to form a main blade terminal contacting portion which is resiliently deflectable when engaged by an inserted blade terminal.

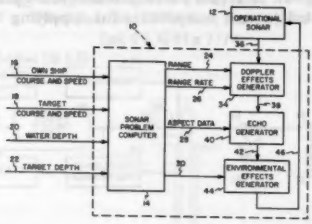
3,713,081

GENERATION OF DOPPLERIZED, ASPECT DEPENDENT, HIGHLIGHTED SIMULATED ECHOES

Francis J. Murphree, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 16, 1971, Ser. No. 134,558
Int. Cl. G09b *9/00*
U.S. Cl. 340—3 E **6 Claims**

Sonar echoes are simulated with doppler effects characterized by frequency shifts proportional to the transmitted frequencies. Memory and logic means read in and store a digital representation of sonar signal at a set rate and then read out the signal at a rate determined by range rate of



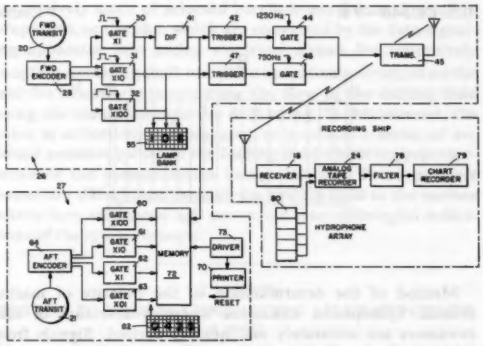
change. An aspect dependent echo highlight generator and an aspect dependent attenuator both utilizing digital techniques are described as part of the simulation apparatus.

3,713,082

OPTICAL RANGING SYSTEM

Richard K. Menoche, Portsmouth, N.H., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 1, 1971, Ser. No. 176,934
Int. Cl. H04b *11/00*
U.S. Cl. 340—5 R **10 Claims**



A ranging system for determining point-continuous ranges in real time between a surface ship and a hydrophone array using optical and electronic devices on board ship and having an accuracy of ±5 percent at ranges up to 1500 yards is provided. Pairs of transits on each side of the ship each contain a high resolution digital encoder which is mechanically coupled to a telescope of selected power. The fore and aft encoders on either side are sampled at selected intervals of the forward encoder, causing a digital printer on board ship to print out the observed angle of a buoy which marks the position of the hydrophone array. Data is earmarked when the forward encoder is abeam of the buoy and the closest point of approach in yards is calculated. Hydrophone readings at the CPA provide a reliable acoustic signature of the ship at the calculated range.

3,713,083

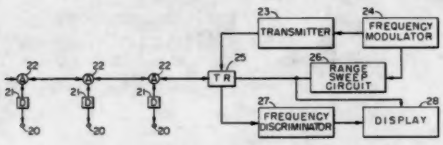
VLF ACTIVE SONAR

William R. Hunnicutt, Jr., 3301 P Street, N.W., Washington, D.C.

Filed July 28, 1960, Ser. No. 46,035
Int. Cl. G01s *9/66*
U.S. Cl. 340—3 R **3 Claims**

1. An underwater transducer system comprising a plurality of spaced substantially coplanar fluids wave transducers con-

structed and arranged to transmit fluid wave energy parallel to a common plane, said transducers including faired housing means for reducing fluid friction as said transducers are moved in a given direction parallel to said plane transmitting means coupled to said transducers for supplying frequency



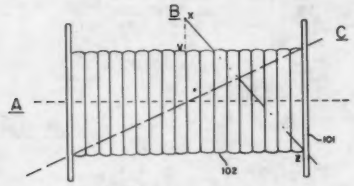
modulated output signals thereto over a preselected frequency range, receiving means coupled to said transducers for detecting and displaying the frequency of subsequent reflected signals as a function of time, said transducers being spaced by at least a quarter-wavelength at the lowest frequency in said preselected range.

3,713,084

METHOD OF POLARITY DETERMINATION OF MARINE HYDROPHONE STREAMERS

William H. Mayne, and Roy G. Quay, both of San Antonio, Tex., assignors to Petty Geophysical Engineering Company, San Antonio, Tex.

Filed June 8, 1970, Ser. No. 44,379
Int. Cl. G01v *1/38*
U.S. Cl. 340—7 R **7 Claims**



Method of the determination of the polarity of marine seismic hydrophone streamers whereby detectors in said streamers are accurately and quickly excited. Signals from said detectors are recorded before deployment of said streamer into the water. This invention provides for the use of a low frequency sound source in the air near a hydrophone streamer while onboard a seagoing vessel. The low frequency of the pressure source is adequately selected to allow similar responses from the receiving detectors within the hydrophone streamer. In order to achieve this similarity of response, the wavelength emitted from the source must be more than twice the difference of subtracting the maximum source-to-detector distance and the minimum source-to-detector distance of the streamer, as confined compactly onboard.

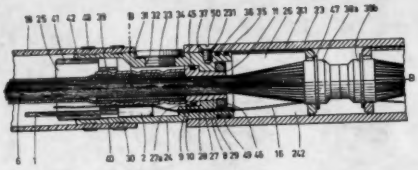
3,713,085

ACOUSTIC WAVE RECEIVER FOR UNDERWATER SEISMIC PROSPECTING

Jean Laurent, Saint Germain en Laye, and Claude Duconge, Le Vesinet, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, France

Filed Dec. 29, 1970, Ser. No. 102,416
Claims priority, application France, Dec. 30, 1969, 6945582
Int. Cl. G01v *1/20*
U.S. Cl. 340—7 **5 Claims**

Acoustic wave receiver for underwater seismic prospecting comprising a plurality of tubular sections filled with liquid and containing coupled pressure sensors, at least one impedance adapter, electric wires interconnecting said sensors, a multiconductor cable and towing cables, end couplers at the extremities of section comprising means for anchoring the tow-



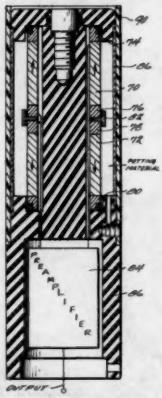
ing cables and means for electric connection to the multiconductor cable, said sections being coupled by means of coupling sleeves surrounding the end couplers in a tight manner.

3,713,086

HYDROPHONE

Winfield James Trott, 3907 Menlo Drive, Doraville, Ga.

Filed Sept. 25, 1969, Ser. No. 861,071
Int. Cl. H04r *17/00*
U.S. Cl. 340—10 **20 Claims**



A hydrophone suitable for measuring underwater sound down to the level of the lowest ambient sea noise and at frequencies from approximately 1 Hz to 40 KHz wherein two longitudinally polarized piezo-ceramic tubes with the ends of each acoustically isolated from the sound field are electrically connected in parallel to each other and to the input of a solid state preamplifier housed within the region interior to the tubes. A thin, hollow metal cylinder surrounds the piezo-ceramic tubes, is acoustically coupled to the tubes by a suitable potting compound and forms an acoustically transparent stress member capable of withstanding substantial hydrostatic pressure. As an alternate the stress member can be within the region interior to the tubes and the preamplifier housed at the end of the hydrophone structure.

3,713,087

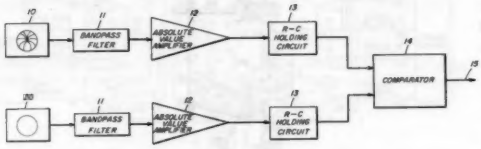
ACOUSTICAL DIRECTION DETECTOR

Benjamin B. Bauer, Stamford, and Edward J. Foster, Ridgefield, both of Conn., assignors to Columbia Broadcasting System, Inc.

Filed Nov. 3, 1970, Ser. No. 86,447
Int. Cl. G01s *3/00*
U.S. Cl. 340—16 R **4 Claims**

An acoustical detection apparatus for determining the direction of origin of sounds. A first acoustic receiving system

having a relatively high uniform sensitivity in a predetermined plane and a relatively low sensitivity in and about the direction perpendicular to the plane is provided. A second acoustic receiving system having a spherical sensitivity pattern is also provided. The sensitivity of the second system is set substantially equal to the sensitivity of the first system in the predetermined plane. Means are provided for comparing the outputs of the first and second systems, the ratio of these outputs indicating the direction from which received sounds are arriving. In a preferred embodiment of the invention, the first acoustic receiving system has a donut-shaped reception characteristic.

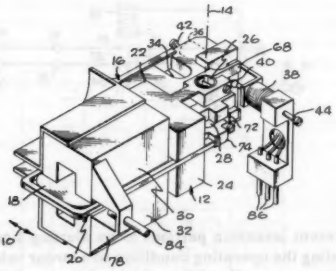


3,713,088

REMOTELY OPERATED SEISMOMETER

Francis E. Lehner, Monrovia, and Wayne F. Miller, Arcadia, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Aug. 13, 1970, Ser. No. 63,512
Int. Cl. G01v 1/16
U.S. Cl. 340—17 **10 Claims**



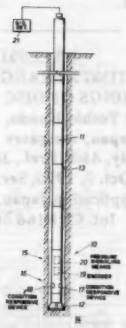
A seismometer suitable for remote operation to measure quake components, comprising a boom mounted for pivoting about a nominally vertical or other axis, the boom carrying a sensing coil and a small iron slug. A pair of calibration coils mounted on opposite sides of the slug can be individually energized to deflect the boom in opposite directions from its static position. The sensing coil outputs resulting from separate energizations of the calibration coils, indicate the precise static position of the boom and therefore, in the case of a boom intended to pivot about a vertical axis, the angle of its nominally vertical axis of pivoting from a true vertical. The sensing coil is flat and is surrounded by a frame of non-conductive material with conductive layers on opposite sides that are electrically connected to the ends of the coil. The frame is supported by a pair of mass members which are insulated from each other but connected to the respective conductive layers on the frame. The mass members are mounted on separate Cardin hinges, and currents generated by the sensing coil are transmitted through the Cardin hinges to output terminals.

3,713,089

DATA-SIGNALING APPARATUS FOR WELL DRILLING TOOLS

Jackson R. Clacomb, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed July 30, 1970, Ser. No. 59,394
Int. Cl. G01n 1/14
U.S. Cl. 340—18 LD **15 Claims**



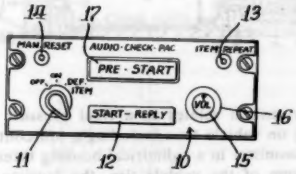
In the preferred embodiment of the invention disclosed herein, a well tool having new and improved data-signaling apparatus and carrying a drill bit on its lower end is dependently coupled with a drill string and lowered into a borehole being excavated. During the drilling operation, measurements are successively made of selected borehole conditions, formation properties, or the like, which are converted by the data-signaling apparatus into coded electrical signals for repetitively coupling a rotating shaft to a valve operatively arranged on the tool for selectively interrupting the flow of the drilling fluid being circulated through the drill string. In this manner, the valve is selectively reciprocated to produce a series of encoded pressure pulses in the drilling fluid which are representative of the measurements being obtained. These pressure pulses are transmitted through the drilling fluid to the surface where they are sensed and converted into meaningful indications of the measurements.

3,713,090

SYSTEM FOR USE IN CONDUCTING AIRCRAFT CHECK LISTS

Clarance B. Dickinson, Tower 6, Bath & Tennis Club, North Green Bay Rd., Lake Bluff, Ill.

Continuation-in-part of Ser. No. 841,675, June 26, 1969, abandoned. This application Sept. 3, 1970, Ser. No. 69,254
Int. Cl. G08g 5/02
U.S. Cl. 340—27 R **5 Claims**



The system is for use in an aircraft, and it includes a number of pre-recorded messages or check lists, either emergency (in which case selection is automatic) or normal operational. Each message includes a number of separate items arranged in sequence. A desired list is selected either manually by the pilot or automatically by an emergency sensor, and a pre-recorded audio signal announces the first item over a speaker. The tape is then shut off, giving the pilot time to check the item. The

pilot, when he is satisfied the item is operational, presses a reply bar to proceed with subsequent items. The tap re-winds automatically when the end of a message is reached and shuts down at the start of message position. In the case of an emergency, the system will interrupt a previously selected message if it is also not an emergency check list, return to the start of the proper emergency check list, and transmit an emergency radio signal. Circuitry permits repetition of an item if desired; and the pilot may selectively reset the message in high speed before completing it.

3,713,091

WEAR INDICATING ARRANGEMENT FOR BRAKE LININGS OF DISC BRAKES

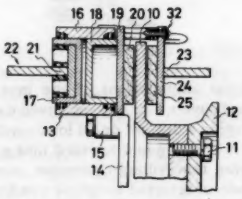
Toyoaki Kobayashi; Toshio Kondo, and Naoji Sakakibara, all of Hekikaigun, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Aich. Pref., Japan

Filed Oct. 2, 1970, Ser. No. 77,519

Claims priority, application Japan, Nov. 1, 1969, 44/79449

Int. Cl. F16d *66/02*

U.S. Cl. 340—52 A **10 Claims**



A brake wear indicator for detecting the depth of wear of a brake lining for use on a disc brake, comprising an indicating circuit connected to a source of power and a switch means, said switch means being actuated independently of the braking surfaces of the disc even when the brake linings wear down beyond a predetermined depth whereby the braking surfaces of the disc are not injured.

3,713,092

AIR PRESSURE BALANCED SELF-CONTAINED TIRE PRESSURE CONDITION SIGNAL TRANSMITTER

Bernard Ivenbaum, 2319 Ocean View Avenue, Apt. 25, Los Angeles, Calif.

Filed Oct. 23, 1970, Ser. No. 83,515

Int. Cl. B60c *23/04*

U.S. Cl. 340—58 **1 Claim**

This invention relates to a fluid pressure alarm for use primarily on vehicle tires including a self-contained powered radio transmitter in a cylindrical housing threaded on the inflation stem of the vehicle tire, the housing having means maintaining pressure communication between the interior of the tire and that of the housing, and a pressure responsive switch device biased by control pressure in a control pressure compartment of the housing and movable to energize the transmitter upon a predetermined pressure differential between that of the control compartment and that of the vehicle tire, the radio signal to be picked up by a receiver in the cab of the vehicle. it can be used as a pressure differential alarm on other pressurized gas or liquid environments.

3,713,093

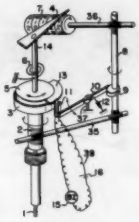
VEHICLE SPEED ALARMING DEVICE

Masakatsu Matsumura, Innan-gun, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe-shi, Japan

Filed March 1, 1971, Ser. No. 119,666

Int. Cl. G08b *21/00*

U.S. Cl. 340—62 **9 Claims**



A rotating permanent magnet of a speedometer affords a rotational force for a non-magnetic element with a switch operating member provided thereon. A switch contact is arranged to make a reciprocal motion relative to the non-magnetic element. When the speed has reached an alarming level, the switch contact is closed by engagement with the switch operating member, whereby an alarm is issued.

3,713,094

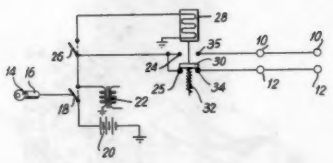
AUTOMATIC VEHICLE ALERTING SIGNAL SYSTEM

Armand S. Damico, 65-15 79th Place, Middle Village, N.Y.

Continuation-in-part of Ser. No. 578,764, Sept. 12, 1966, Pat. No. 3,497,871. This application Feb. 20, 1970, Ser. No. 13,148

Int. Cl. B60q *1/50*

U.S. Cl. 340—66 **3 Claims**



The present invention pertains to an alerting signal system for indicating the operating condition of a motor vehicle to apprise drivers rearwardly of the vehicle of the condition and actions of the vehicle and which may utilize the existing tail illuminating lights or lamps and other lamps to indicate the operating condition of the vehicle and any changes thereof. The two filaments of a dual filament bulb are employed in combination with coupling means, an ignition switch and an accelerator such that when the ignition switch is on, one of said filaments is illuminated; and when the other of said filaments is illuminated, said first one of said filaments is turned off and there is an indication only that said ignition switch is on and the accelerator is supplying fuel to the vehicle's engine.

3,713,095

DATA PROCESSOR SEQUENCE CHECKING CIRCUITRY

Alan Forbes McPherson, Mount Tabor, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

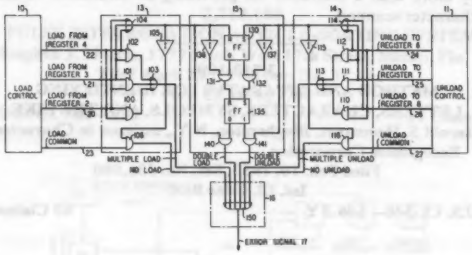
Filed March 16, 1971, Ser. No. 124,736

Int. Cl. G06f *11/00*

U.S. Cl. 340—146.1 AB **13 Claims**

Apparatus for detecting illogical sequences of operations in digital processor units. Apparatus comprising logic gates is in-

cluded at several points within a processor unit to provide early detection of hardware failures. The apparatus is



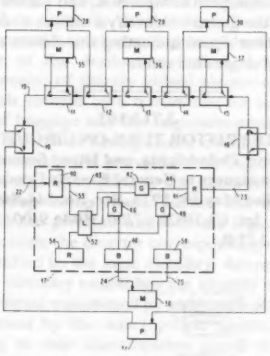
designed to monitor the sequence of operations that occur when particular processor registers are loaded from a plurality of sources and unloaded to a plurality of destinations.

3,713,096

SHIFT REGISTER INTERCONNECTION OF DATA PROCESSING SYSTEM

Webb T. Comfort, Wappingers Falls, and George Radin, Piemont, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 31, 1971, Ser. No. 129,747
Int. Cl. G06f *13/00, 15/16*
U.S. Cl. 340—172.5 **3 Claims**



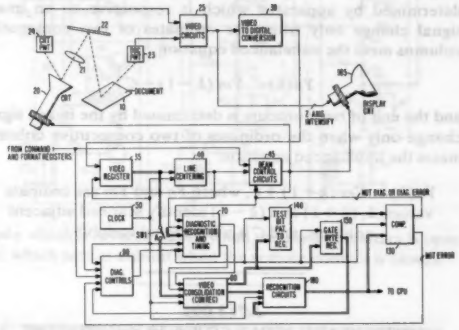
Units of a data processing system send and receive messages by means of a ring connection of shift register stages. One unit places a message with suitable control bits in an associated shift register stage of the ring and after a series of shifts, the destination unit receives the message at its stage of the ring. The invention overcomes the problem that a message from a downstream unit to a nearby upstream unit is ordinarily required to be shifted almost entirely around the ring with a delay introduced at each stage of the ring. Some of the units are connected to enter messages at register stages upstream of other units and to receive messages at register stages downstream of the other units. Units connected in this configuration have shortened data paths in either direction of communication. Several useful configurations are disclosed.

3,713,097

TEST BIT PATTERN GENERATOR FOR PATTERN RECOGNITION MACHINES

John D. Linnerooth, Rochester, and Erhardt W. Rosen, Kasson, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 14, 1971, Ser. No. 143,423
Int. Cl. G06f *11/04*
U.S. Cl. 340—146.3 ED **10 Claims**



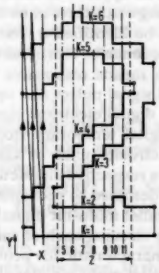
The scanner of the pattern recognition machine scans a preprinted document containing a number of patterns which correspond to the number of test bits to be produced. There are two distinguishing patterns which produce binary one and zero bits. The patterns are printed in a sequence dictated by the desired test bit pattern. The resulting binary bits forming the test pattern are applied to the recognition logics. The preprinted document also carries a set of patterns which, when scanned, produce a binary bit pattern identifying the test bit pattern. This identification is compared with the identification bit pattern produced by the recognition logics. An equal comparison indicates that the recognition logics are functioning properly. An error condition causes the pre-printed pattern to be displayed. The machine operator or maintenance man can read the display and determine which recognition logics should be probed to find the error.

3,713,098

METHOD AND APPARATUS FOR DETERMINING AND STORING THE CONTOUR COURSE OF A WRITTEN SYMBOL SCANNED COLUMN BY COLUMN

Meinolf Muenchhausen, and Ekke Weber, both of Gauting, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 25, 1971, Ser. No. 127,925
Claims priority, application Germany, April 10, 1970, P 20 17 246.7
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 AC **7 Claims**



A method and apparatus for the determination and intermediate storage of a written symbol which consists of several

contours and which is scanned column-wise, and which utilizes the scanning results of two adjacent scanning columns. In each scanning column, a contour is determined at a change of the digitalized image signal from one phase to another and the phase changes are counted consecutively so that each contour is assigned a certain address in a contour memory. Apparatus is employed to determine the difference values of the ordinates of a contour occurring in the adjacent scanned columns quantitatively and these difference values are stored in the contour memory. The start of a pair of new contours is determined by apparatus which is responsive to an image signal change only when the ordinates of two consecutive columns meet the unbalanced equation

$$Yn(k) \quad Ym\,(k-1)+C$$

and the end of two contours is determined by the image signal change only when the ordinates of two consecutive columns meets the unbalanced equation

$Yn(k) > Ym\,(k+1)+C$, where Yn and Ym are ordinate values, k, $(k+1)$ and $(k-1)$ identify scanned adjacent columns, and C is a functional variable.

3,713,099

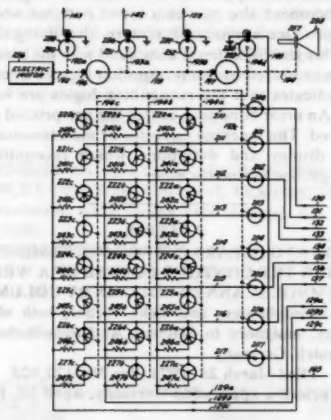
METHOD AND APPARATUS FOR IDENTIFYING LETTERS, CHARACTERS, SYMBOLS AND THE LIKE

Harold S. Hemstreet, Binghamton, N.Y., assignor to Character Recognition Corporation

Division of Ser. No. 336,080, Feb. 10, 1953. This application Aug. 4, 1959, Ser. No. 831,599

Int. Cl. G06r 9/00

U.S. Cl. 340—146.3 D **96 Claims**



Character recognition apparatus, comprising, in combination: means for scanning characters to be identified to provide for each character to be identified a time-varying first signal comprising a serial sequence of electrical signal pulses; serial-to-parallel conversion means responsive to each said serial sequence of electrical signal pulses and operable to provide a first parallel multi-bit digital electrical signal, said conversion means including a digital temporary storage means; a multiplicity of matching circuits, each of said matching circuits being associated with a respective character of a set of characters said apparatus is designed to recognize; means for applying each said first parallel multi-bit digital electrical signal to each of said matching circuits, each of said matching circuits having an electrical characteristic for providing, upon receipt of each said first parallel multi-bit digital electrical signal, a first respective analog output signal having a magnitude which varies as a function of the degree of match between the character scanned and its respective associated character of said set; and comparison means responsive to said first analog output signals from said matching circuits for determining if said analog output signals do not differ from reference values by more than a tolerance for providing an indication of the character scanned.

3,713,100

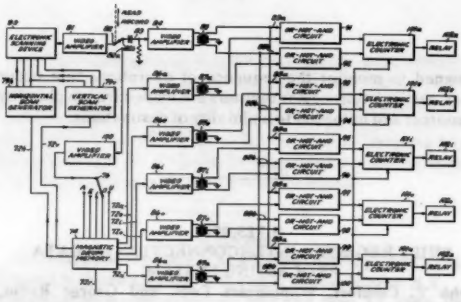
METHOD AND APPARATUS FOR IDENTIFYING LETTERS, CHARACTERS, SYMBOLS, AND THE LIKE

Harold S. Hemstreet, Binghamton, N.Y., assignor to Character Recognition Corporation

Filed Feb. 10, 1953, Ser. No. 336,080

Int. Cl. G06r 9/00

U.S. Cl. 340—146.3 Y **65 Claims**



17. In a character recognition machine, means to compare a single character of a limited group of characters being recognized with all of a plurality of memory elements, each of said memory elements defining one of all of the possible characters of the group to be recognized, means for producing a group of separate signals as a result of the individual comparisons, the magnitude of each of said signals being an indication of the degree of match in each comparison, and means responsive to said signals of the group to identify a unique circuit associated with the optimum signal indicating the closest match and indicative of said single character.

3,713,101

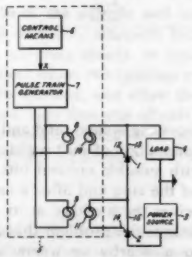
THYRISTOR TURN-ON CIRCUIT

Dante E. Piccone, Philadelphia, and Istvan Somos, Lansdowne, both of Pa., assignors to General Electric Company

Filed May 19, 1971, Ser. No. 144,840

Int. Cl. H03k 17/00; H04q 9/00

U.S. Cl. 340—147 R **8 Claims**



A triggering circuit is provided for supplying trigger signals to the gate of a high voltage controlled rectifier. The triggering circuit includes a transmitting antenna connected to a pulse train generator and electromagnetically coupled, via a dielectric medium, to a receiving antenna. The receiving antenna is

coupled to the gate of the controlled rectifier for providing energy pulses thereto. A feedback winding is connected in parallel with the transmitting antenna.

3,713,102

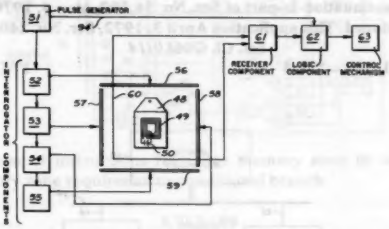
PULSE INTERROGATION ARTICLE-SORTING SYSTEM

Stephen J. Martin, 1777 South West 17th Street, Miami, Fla.

Filed April 23, 1970, Ser. No. 31,141

Int. Cl. H04q *7/00*

U.S. Cl. 340—152 **11 Claims**



A pulse interrogation article-sorting system for identifying and directing articles along a distribution network, such as passenger baggage along a conveyor therefor at an airline terminal. A particular form of the article-sorting system for airline baggage includes a conveyor having both a collection section along which baggage is accumulated and a distribution section providing a plurality of distribution branches or stations respectively corresponding to particular flight destinations and into which articles of baggage are selectively diverted in accordance with the destinations thereof. A plurality of diverters disposed in respective association with the distribution branches are operative selectively to effect diversion thereinto of individual articles of baggage being advanced along the conveyor. Each article of baggage carries a tag equipped with a normally passive identification responder operative to transmit an electromagnetic identification signal representative of the destination indicated by the tag in response to receipt of sharply pulsed electromagnetic interrogation signals emitted by a transmitter for interception by each article of baggage and the responder-equipped tag carried thereby. A receiver having sensor circuitry responsive to the identification signals provides both logic circuitry for processing the signals to identify the same in terms of their destination-distinguishing characteristics and control means connected with the diverters and with the logic circuitry and operative to actuate the diverter corresponding to the particular signal identified by the logic circuitry. Accordingly, whenever the logic circuitry establishes the identity of a particular identification signal transmitted by an identification responder being intercepted by the interrogation signals, the diverter corresponding to that identification signal is actuated to segregate or divert into the appropriate branch the article of baggage carrying such transmitting responder.

3,713,103

REMOTE CONTACT SENSING SCANPOINT MATRIX

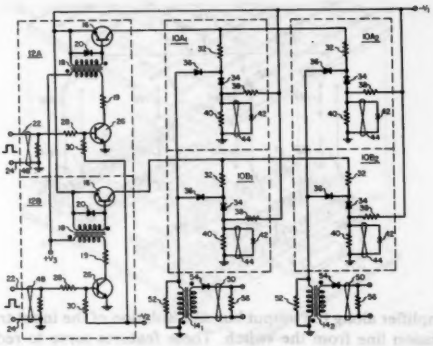
Frank A. Risky, Cicero, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 29, 1971, Ser. No. 158,008

Int. Cl. H02h *3/04*; H04q *1/00*

U.S. Cl. 340—166 R **10 Claims**

A scanpoint matrix for monitoring the state of remote contacts includes an array of scanpoints arranged in rows and columns. A driver is coupled in parallel to each scanpoint in a row and output means are coupled in parallel to each scanpoint in a column. Each scanpoint is coupled to a remote contact to be monitored and includes a voltage divider and a



diode which is reverse biased when the remote contact is open and which acts as a shunt when the remote contact is closed.

3,713,104

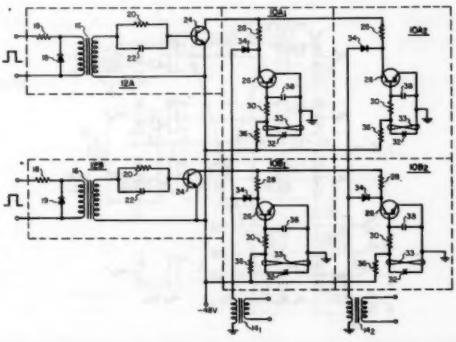
ELECTRONIC SCANPOINT MATRIX WITH SWITCH MONITORING

Frederick A. Stich, Milwaukee, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 29, 1971, Ser. No. 158,009

Int. Cl. H02h *3/04*; H04q *1/00*

U.S. Cl. 340—166 R **8 Claims**



An electronic scanpoint matrix for supervision of the states of a plurality of signal lines includes an array of scanpoints arranged in rows and columns, each scanpoint including a pnp transistor coupled to a signal line to be supervised and having selected conduction properties related to the state of its associated signal line. A pulsed d.c. electrical signal is coupled to each row of scanpoints and the pulsed input is coupled to an output associated with each column of scanpoints when a given transistor scanpoint is in a non-conducting state.

3,713,105

WIDE-BAND, HIGH-FREQUENCY MATRIX SWITCH

Stanley Rogers, La Jolla, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

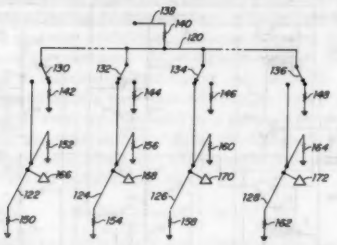
Filed March 29, 1971, Ser. No. 129,067

Int. Cl. H04q *1/18*

U.S. Cl. 340—166 R **5 Claims**

An improved matrix switch for use in wide-band high frequency applications is disclosed. In this switch, any of a plurality of input buses are connectable through crosspoint switches to any of a plurality of output buses. Features of the

invention include the provision of dummy loads on input buses which are not connected to output buses, double-terminated output buses, center fed input buses, centering of the output



amplifier along the output bus and isolation of the input transmission line from the switch. These features serve to reduce voltage irregularities on the buses, reduce propagation delay differences through the switch, reduce crosstalk, etc.

3,713,106

SWITCHING SYSTEM FOR INTERCONNECTED PCM LINES

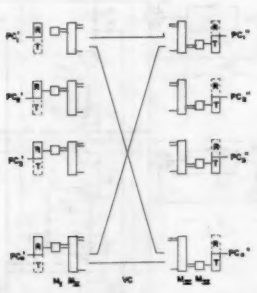
Giorgio Dal Monte, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Feb. 10, 1971, Ser. No. 114,328

Claims priority, application Italy, Feb. 10, 1970, 20398 A/70

Int. Cl. H04j 3/00

U.S. Cl. 340—172.5 **9 Claims**



For the selective establishment of temporary connections between a number of incoming pulse-code-modulation channels on one or more lines terminating at an exchange and a like number of outgoing channels of this type on one or more lines originating at that exchange, the two sets of channels being sampled in different rhythms, the exchange generates a succession of transfer periods *tx* at a frequency higher than each of the two sampling frequencies. Each sampling period is divided into several time intervals at least one of which has a duration equal to or less than the difference $\Delta t'$ between the sampling period *tp'* of the incoming channels and the transfer period *tx*. During the latter time interval, occurring, at least once per sampling period *tp'*, the bits inscribed by each incoming channel in either of two alternately receptive registers (A, B) of a first memory stage M_I are transferred to a respective register of an intermediate memory stage (M_{II} or M_{III}) having one register for each incoming channel. From there, possibly after transmission to another intermediate memory stage (M_{III}) with the same number of registers during the remaining part of a transfer period, the bits are read out to either of two alternately receptive registers (C, D) of a final memory stage (M_{IV}) during another time interval whose duration is equal to or less than the difference $\Delta t''$ between the sampling period *tp''* of the outgoing channels and the transfer period *tx*. The two registers (C, D) of the final memory stage are alternately discharged in the rhythm of the outgoing channels for delivering their contents to the latter channels in a sequence determined by a pattern of temporary connections established between two of the memory stages under the control of an associated programmer.

3,713,107

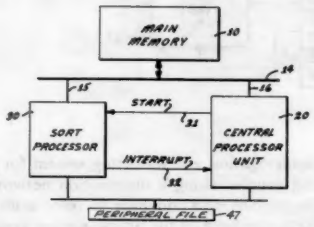
FIRMWARE SORT PROCESSOR SYSTEM

Harut Barsamian, Torrance, Calif., assignor to The National Cash Register Company, Dayton, Ohio

Continuation-in-part of Ser. No. 34,397, May 4, 1970, abandoned. This application April 3, 1972, Ser. No. 240,557

Int. Cl. G06f 9/14

U.S. Cl. 340—172.5 **17 Claims**



A system and architecture is disclosed for an electronic data processing system wherein the usage of a central processing unit in the system may be reduced and much of its work efficiently handled by a cooperating Sort Processor. The Sort Processor is an internally programmed black box unit that can be connected to the memory bus of almost any computer. It performs background sorting functions in real time or on-line installations, or operates as a stand-alone low priority processor in a uni-processor or multi-processor installation. A Control Program initiates the action of the sort processor so that it operates autonomously and performs the functions of the "sort routine" in both internal sort and merge phases resulting in the saving of considerable Central Processing Unit time, main memory space, and simplification and reduction of programming efforts. The Sort Processor consists of search memory for storing the initial parameters of the sort operation, and a control memory for micro-program storage.

3,713,108

BRANCH CONTROL FOR A DIGITAL MACHINE

Gene H. Edstrom, and John W. Irwin, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

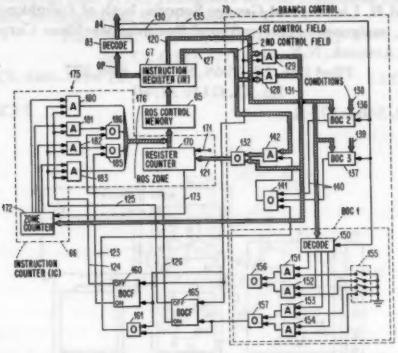
Filed March 25, 1971, Ser. No. 127,895

Int. Cl. G06f 9/20

U.S. Cl. 340—172.5 **24 Claims**

A program control for a machine operating with a set of instruction words having an operation code field with first and second control fields. The first control field is usually used for branch control, while the second control field has an alternate address for fetching the next instruction word within a given sized memory zone. Branch control means are responsive to predetermined ones of said operation code and first control field permutations for selecting a branch on condition (BOC). Most BOC's are limited to branching within the zone of memory from which the present instruction was fetched. Other BOC instructions use the condition on which a branch is to be based to modify the address from which the next instruc-

tion is fetched such that other zones of memory may be reached by a BOC. In other branch instructions, moving the

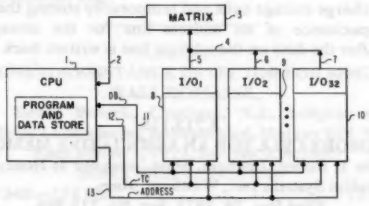


program of instructions from one memory zone to another memory zone requires an unconditional branch.

3,713,109
DIMINISHED MATRIX METHOD OF I/O CONTROL

Louis Michael Hornung, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,740
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **14 Claims**



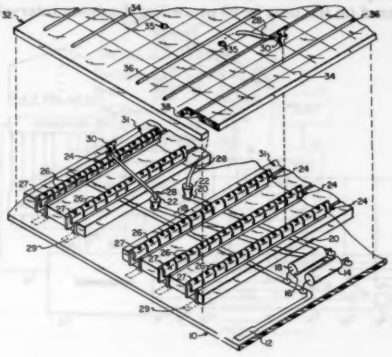
A technique of I/O control in which an I/O instruction contains a three-bit working device code (WDC) which is used to table lookup the actual device code (ADC) of the device to be serviced. The ADC is transmitted to all of the devices which then compare the code with their wired-in codes and the addressed device then stores the WCD which is simultaneously transmitted. During interrupt requests the WDC stored in the devices is decoded and used to select one of eight interrupt request lines. The eight interrupt request lines are applied to a matrix which determines which of the eight is of highest order priority. The output of the matrix is encoded to provide a WDC corresponding to the device of highest order priority and transmitted to all of the devices to identify the device which is to hive it's interrupt request honored. The number of ADC's may be greater than the number of WDC's allowing for the attachment of a number of devices in excess of the size of the matrix and likewise in excess of other facilities in the I/O adapter. Further, provision is made for the attachment of devices which may be identical in all respects including wired-in codes for identifying the devices.

3,713,110
MECHANICALLY ALTERABLE DIODE MATRIX MEMORY

Joseph C. Bennett, Lisle, and William A. Reimer, Wheaton, both of Ill., assignors to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Aug. 23, 1971, Ser. No. 182,679
Int. Cl. G11c *5/06, 17/00*
U.S. Cl. 340—173 SP **6 Claims**

A planar diode matrix memory includes a pluggable wire strap to couple a diode between an input conductor on a printed wiring card and output bus bar. The rearrangement of

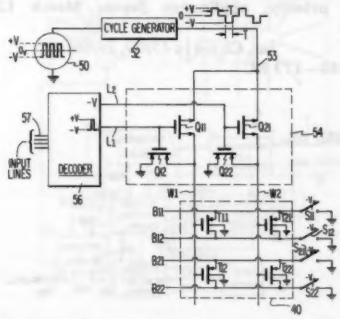


the diode couplings is easily made via rearrangement of the wire straps.

3,713,111
OPERATION OF MEMORY ARRAY EMPLOYING VARIABLE THRESHOLD TRANSISTORS

Edward Charles Ross, Hightstown, N.J., assignor to RCA Corporation

Filed Dec. 14, 1970, Ser. No. 97,798
Int. Cl. G11c *11/34, 11/40*
U.S. Cl. 340—173 R **8 Claims**



Means for cycling a variable threshold field-effect semiconductor memory device to one selected threshold level and then to another selected threshold level before each write operation to minimize a shift in the selected threshold levels.

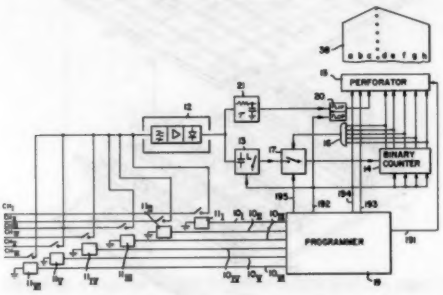
3,713,112
REGISTRATION OF NOISE LEVEL IN COMMUNICATION SYSTEMS

Karl Heinz Heidenreich, 7419 Neuhausen/Erms, Germany, assignor to Wandel u. Goltermann, Reylingen, Germany

Filed Feb. 24, 1971, Ser. No. 118,336
Claims priority, application Germany, Feb. 26, 1970, P 20 08 954.7
Int. Cl. G01d *9/16;* **G11c** *19/00*
U.S. Cl. 340—173 R **15 Claims**

A noise detector receiving the outputs of one or more message channels works into a quantizer which, in response to a predetermined rise in cumulative noise, delivers a stepping pulse to a binary counter whose several stage outputs control respective hole punchers of a tape perforator. The quantizer and the counter are periodically reset by a programmer which also actuates another puncher to mark the beginning of each

new day. A 1-hour average of the minute-mean noise-power values may be ascertained by a summing circuit which simultaneously receives, every 6 minutes, the 1-minute-mean values registered on the tape in 10 preceding 6-minute intervals; the



output current of the summing circuit is compared with a reference current whose magnitude is 10 times that of a reference current equivalent to the maximum allowable 1-hour average.

3,713,113

HIGH SPEED PATTERN MASS MEMORY DEVICE

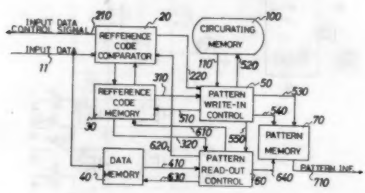
Sadao Kohzuma, Yamato-shi; Shigetsuyo Hasuo, Meguro-ku, Tokyo; Kenichi Tada, Tozuka-ku, Yokohama, and Takayuki Itoh, Kawasaki-shi, all of Japan, assignors to Takachibo Koeki Kabushiki Kaisha, Kita-ku, Osaka-shi, Japan

Filed March 13, 1972, Ser. No. 234,160

Claims priority, application Japan, March 12, 1971, 46/13091

Int. Cl. G11c *15/00, 21/00*

U.S. Cl. 340—173 RC **2 Claims**



A high speed pattern mass memory device for selecting and reading out any of character pattern information for printing or display from a mass information source including a number of different character patterns, in which all the handled character patterns are provided in a sequential-access mass-memory of low price while a rewritable random-access memory having an appropriate small memory capacity is provided as a second pattern memory connected to output so that the number of handled pattern information blocks different from one another is effectively increased in comparison with the small memory capacity of said random-access memory by transferring only different character patterns from the sequencial-access mass-memory to the random-access mass memory in response to reference code units of an input data signal. The character patterns in the random-access memory are read out at a time by regenerating a train of the input data signal. Character patterns each having a high frequency in use may be fixedly stored in the random-access memory while only remainder character patterns other than the fixed character pattern are provided in the sequential-access mass memory and read out after temporarily storing to rewritable memory zones of the random-access memory.

3,713,114

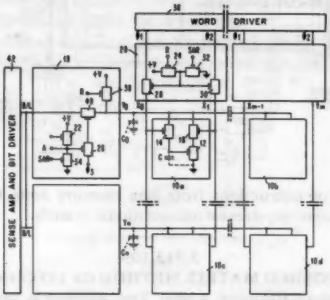
DATA REGENERATION SCHEME FOR STORED CHARGE STORAGE CELL

Richard H. Linton, and George Sonoda, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1969, Ser. No. 886,277

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **7 Claims**



This specification discloses a scheme for regenerating the data in stored charge storage cells of monolithic memories. The scheme involves periodic reading out of the data in the stored charge storage cells and temporarily storing the data in the capacitance of an address line for the storage cell. Thereafter the data on the address line is written back into the cell.

3,713,115

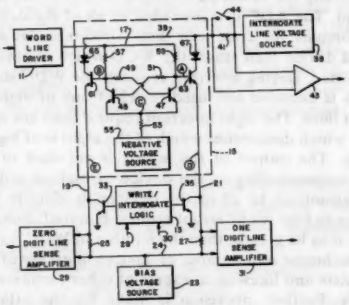
MEMORY CELL FOR AN ASSOCIATIVE MEMORY

Franklin T. Duben, Dedham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 29, 1971, Ser. No. 215,966

Int. Cl. G11c *7/00, 11/40;* **H03k** *17/00*

U.S. Cl. 340—173 AM **15 Claims**

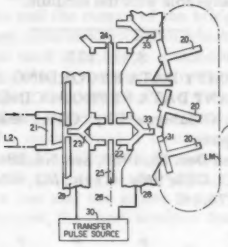


A memory cell of the bistable type which is capable of being read from, written into or having its contents interrogated is disclosed herein. The memory cell performs these various operations through a minimal number of external line connections which include a word line and an interrogate line. The memory cell is capable of being arrayed in such a manner as to allow for separate operations on any number of individual cells. The memory cell is also configured in such a way as to allow for a minimal power consumption during standby. An alternative embodiment to the basic memory cell configuration eliminates the need for an interrogate line.

3,713,116
SINGLE-WALL DOMAIN ARRANGEMENT

Peter Istvan Bonyhard, Edison, and Paul Charles Michaelis, Watchung, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 9, 1971, Ser. No. 196,902
Int. Cl. G11c 11/14, 19/00
U.S. Cl. 340—174 TF **12 Claims**

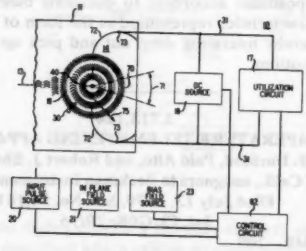


The transfer of a domain from one channel to another in a single-wall domain memory is effected by a transfer loop into which a domain is moved by a field from a pulsed conductor and from which a domain exits in response to a magnetic field rotating in the plane of the layer in which domains move. The transfer loop includes two "exit-entrance" positions associated with the two channels between which transfer occurs. The exit of a domain from the transfer loop may be aided by a pulsed conductor also.

3,713,117
MAGNETORESISTANCE DETECTOR FOR SINGLE WALL DOMAINS

Andrew Henry Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed March 1, 1972, Ser. No. 230,755
Int. Cl. G11c 11/14, 19/00
U.S. Cl. 340—174 EB **10 Claims**



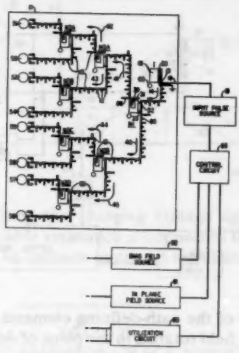
A number of geometries are disclosed for magnetoresistance elements compatible with fine-grained, field-access, single wall domain arrangements that render the elements insensitive to the rotating in-plane magnetic field which moves domains in such arrangements.

3,713,118
SINGLE WALL DOMAIN FANOUT CIRCUIT

Irynej Danylchuk, Morris Plains, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 27, 1970, Ser. No. 41,028
Int. Cl. G11c 19/00, 11/14
U.S. Cl. 340—174 ZA **6 Claims**

An arrangement of magnetically soft overlay elements on a magnetic material, in which single wall domains can be moved, is designed to generate two domains for each domain advanced to it in response to a magnetic field reorienting in the plane of the material. A number of these arrangements are

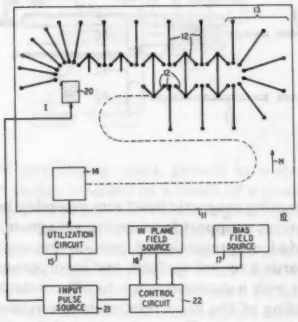


cascaded to perform a fanout function which doubles the number of domains for each cycle of the in-plane field.

3,713,119
DOMAIN PROPAGATION ARRANGEMENT

Andrew Henry Bobeck, 41 Ellers Drive, Chatham, N.J.

Filed May 14, 1971, Ser. No. 143,347
Int. Cl. G11c 21/00, 11/14
U.S. Cl. 340—174 TF **6 Claims**



The geometry of the overlay pattern of elements which cause the movement of single wall domains in response to a reorienting in-plane field in single wall domain arrangements has been found to exhibit enhanced operating characteristics if the extremes of the elements therein are of enlarged geometry to concentrate flux.

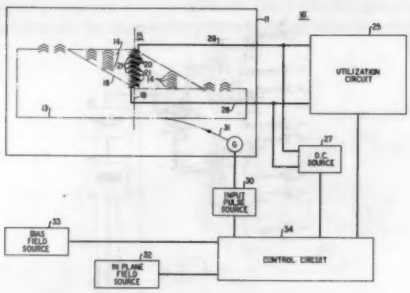
3,713,120
MAGNETORESISTANCE DETECTOR FOR SINGLE WALL MAGNETIC DOMAINS

Andrew Henry Bobeck, Chatham; Frank John Ciak, Roselle Park, and Walter Strauss, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 3, 1972, Ser. No. 240,651
Int. Cl. G11c 21/00, 11/14
U.S. Cl. 340—174 EB **9 Claims**

A relatively large output signal is achieved from an expanded magnetic domain by a relatively long magnetoresistance element in the path of the domain. The relatively long element is formed with a minimum loss of space by including within the magnetoresistance element portions of the already

present magnetic elements which define the path along which the domain moves. Domain movement and expansion is due to

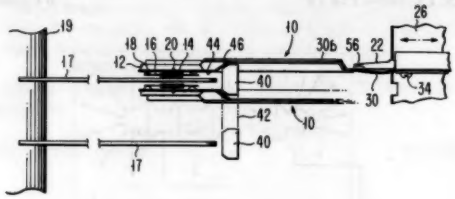


the geometry of the path-defining elements and is responsive to a magnetic field rotating in the plane of domain movement.

3,713,121
ARM VIBRATION DAMPER

Ronald F. Fasano, Los Gatos; Michael R. Hatch, and James E. Riggins, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 25, 1970, Ser. No. 40,033
Int. Cl. G11b *5/60*; G11c *21/20*
U.S. Cl. 340—174.1 E **2 Claims**

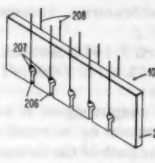


An air bearing magnetic head arm assembly includes a rigid mount portion; a support for carrying a magnetic transducer; a spring-loaded or pretensioned portion for urging the transducer towards a record surface; and incorporates a ramp that cooperates with a stationary cam to effectuate proper loading and unloading of the head relative to the record surface. To minimize resonance effects experienced by the arm during transducing operation, a damping element is inserted between the spring portion and the rigid mount, the damping element being located at the fulcrum of the spring.

3,713,122
SKEWED HIGH DENSITY MAGNETIC HEAD AND METHOD OF MANUFACTURING SAME

Gerald Taylor, Longmont, Colo., assignor to International Business Machines Corp., Armonk, N.Y.

Filed June 4, 1971, Ser. No. 149,974
Int. Cl. G11b *5/28*
U.S. Cl. 340—174.1 F **9 Claims**

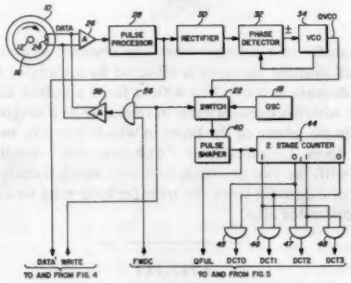


A magnetic transducer reads and writes electric signals recorded as tracks of magnetic manifestations on a magnetic medium moving relative to the transducer. The transducer is a high permeability magnetic sheet with a row of apertures along one edge of the sheet and a narrow slot connecting each aperture to the edge. Each aperture and slot corresponds to one track on the medium. An electric wire is threaded through the aperture for external connection. The edge of the sheet is adjacent the medium and at a fixed angle transverse the direction of relative motion. The angle and the thickness of the sheet determine the track width and, together with the total width of the sheet across the medium, the amount of information exchangeable with the medium.

3,713,123
HIGH DENSITY DATA RECORDING AND ERROR TOLERANT DATA REPRODUCING SYSTEM

James P. Lipp, Oklahoma City, Okla., assignor to General Electric Company

Filed Dec. 18, 1969, Ser. No. 886,316
Int. Cl. G08c *9/04*; G11b *5/82*; H04l *3/00*
U.S. Cl. 340—174.1 G **6 Claims**

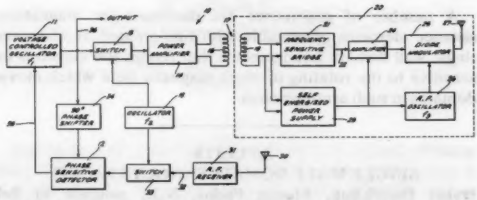


A high density recording and reproducing system in which information is divided into groups of binary digits (bits) with different flux transition patterns recorded in associated storage cells to represent each group of bits and wherein each pattern is recorded by providing a plurality of transition positions in each cell and is read by sensing signal polarity at selected positions according to decisions based on ternary pulse characteristics represented in the form of ternary digits (trits) thereby tolerating drop out and pick up errors at unsensed positions.

3,713,124
TEMPERATURE TELEMETERING APPARATUS

Douglas H. Durland, Palo Alto, and Robert J. Ehret, Los Altos, both of Calif., assignors to Beckman Instruments, Inc.

Filed July 13, 1970, Ser. No. 54,161
Int. Cl. G08c *19/16*
U.S. Cl. 340—209 **5 Claims**



Apparatus for providing, at a remote location, an indication of the temperature of a rotating body, such as the rotor of a centrifuge, comprising a closed loop feed-back circuit including a voltage controlled oscillator positioned remote from the rotor and a frequency sensitive bridge circuit mounted on the rotor. The bridge circuit includes a thermistor such that the

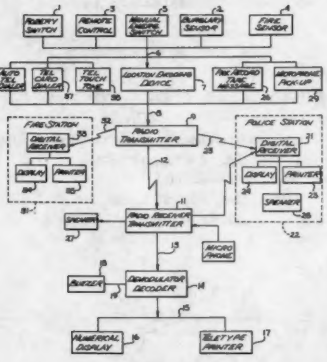
balance frequency thereof is a function of the temperature of the rotor. The output of the voltage controlled oscillator is transmitted to the rotor where it excites the bridge circuit which generates an output signal whose amplitude is a function of the difference between the frequency of the oscillator and the balance frequency of the bridge circuit. The output signal from the bridge circuit is transmitted back to the remote location where it is applied, together with the output of the oscillator, to a phase sensitive detector which serves as an error detector to adjust the frequency of the voltage controlled oscillator to null the output of the bridge circuit. The output of the voltage controlled oscillator which is transmitted to the rotor is also used to energize a self-contained power supply thereby providing power for the rotor-mounted components. In addition, the output of the voltage controlled oscillator is modulated between two amplitude levels before transmission to the rotor-mounted components. When the oscillator output is high and the power supply on the rotor is drawing current, the detector is short-circuited. When the oscillator output is low and the power supply is discharging and not drawing current, the phase sensitive detector is operative.

3,713,125

ALARM SYSTEM UTILIZING A DIGITAL RADIO LINK

Cecil John Miller, 19300 Holsted Street, Northridge, Calif.

Continuation of Ser. No. 794,873, Jan. 29, 1969, abandoned.
This application July 6, 1971, Ser. No. 160,117
Int. Cl. G08b *19/00*
U.S. Cl. 340—224 R **7 Claims**



An automatic digital-encoding burglary-robbery apprehension system is described which utilizes existing telephone lines and direct radio transmission links from an area control center to a patrol car or helicopter. The transmitted alarm signal is digitally coded to provide location identification.

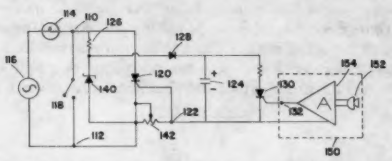
3,713,126

BURGLAR DETERRENT TIMING SWITCH

Joseph C. Stettner, Akron, Ohio, assignor to Novar Electronics Corporation, Barberton, Ohio

Filed Feb. 18, 1971, Ser. No. 116,331
Int. Cl. G08b *13/00*
U.S. Cl. 340—258 D **10 Claims**

A burglar deterrent having a timing switch connected to the lights of a room or building for actuating these lights for a selected period of time in response to a sound made by an intruder. The timing switch has an SCR connected to the switch terminals. The gate of the SCR is connected to a timing circuit which comprises a series connected capacitance and diode connected from the gate to the anode of the SCR. A second SCR has its main terminals connected across the capacitance for, at times, discharging the capacitance in response to a trigger signal at the gate of the second SCR. A zener diode is



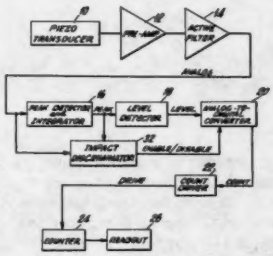
connected for limiting the charging voltage applied to the capacitance. A variable resistance is connected from the gate of the first SCR to its cathode to permit selection and control of the delay time.

3,713,127

ACOUSTIC EMISSION CRACK MONITOR

Francis C. Keledy, Butler, and Kenneth R. Notvest, Ramsey, both of N.J., assignors to Trodyne Corporation, Teterboro, N.J.

Filed Oct. 16, 1970, Ser. No. 81,448
Int. Cl. G08b *21/00*
U.S. Cl. 340—261 **18 Claims**



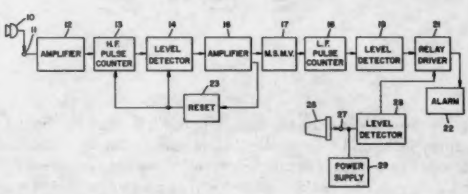
A system for monitoring crack growth in a structure in which acoustic energy released as a result of a crack event is sensed and integrated to provide a binary signal representative of the number and intensity of individual crack events. The binary crack energy data signals are accumulated and a warning device is activated when the stored crack data exceeds a predetermined level. Means may be provided to discriminate crack event signals from similar acoustic signals resulting from noise and impact or vibration.

3,713,128

VAULT ALARM SYSTEM AND METHOD

Stephen Wong; Louis J. Wright; David G. Barleen, and Thomas C. Hankins, all of Oakland, Calif., assignors to Systron-Donner Corporation, Concord, Calif.

Filed Aug. 7, 1970, Ser. No. 61,949
Int. Cl. E05g *3/00*; G08b *13/02*
U.S. Cl. 340—261 **9 Claims**



Alarm system including a microphone and an ion detector for detecting disturbances. The numbers of pulses and sound

bursts in the signal produced by a disturbance are counted in order to distinguish disturbances such as burglars from other disturbances. An alarm is actuated when these counts exceed predetermined numbers. Means is included for simulating separate sound bursts to actuate the alarm in response to disturbance signals of extended duration. An ion detector is included for actuating the alarm in response to smoke and fire. The system is enclosed in a tamper-proof box and also includes tamper-proof cables and an emergency power supply.

3,713,129

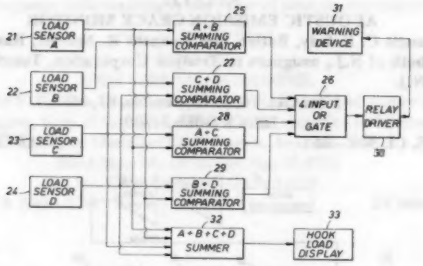
CRANE OVERLOADING PROTECTIVE SYSTEM

Robert T. Buchholz, 15903 Diona Lane, Houston, Tex.

Filed March 30, 1970, Ser. No. 23,544

Int. Cl. G08b 21/00

U.S. Cl. 340—267 C **7 Claims**



A protective system for use with a multiple legged crane wherein a sensor is attached to each leg to determine the change in stress in that leg, and the several sensors are grouped to determine tipping along any side of the crane. Tipping is indicated by a reduced stress in the legs on a given side of the crane. The apparatus further furnishes the total hook load by summing the stress on all the legs.

3,713,130

IMPACT DETECTOR

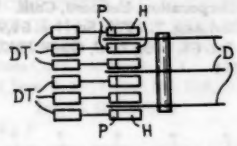
Herbert Leslie Armer, Slough, Buckinghamshire, England, assignor to Mastertape (Magnetic) Limited, Colnbrook Slough, Buckinghamshire, England

Filed March 15, 1971, Ser. No. 124,357

Claims priority, application Great Britain, March 23, 1970, 13,996/70

Int. Cl. G08b 21/00

U.S. Cl. 340—267 R **5 Claims**



An impact detector for detecting input between a record or replay head and a magnetic disc rotating relative to the head comprises a piezo-electric element mounted on one of the bodies, e.g., the head, and producing an output signal when that body contacts or is contacted by the other body, e.g., the magnetic disc. The output is amplified and applied to indicating and/or warning means operated by the amplified output.

3,713,131

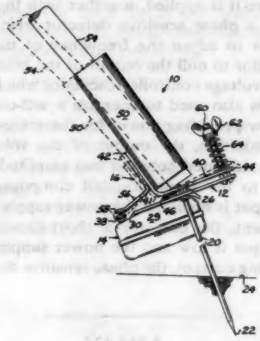
HORN BLOWER FISHING ROD HOLDER

William R. Marshall, 220 Cherokee Lane, El Reno, Okla.

Filed April 2, 1971, Ser. No. 130,746

Int. Cl. A01k 97/12

U.S. Cl. 340—279 **3 Claims**



An upwardly open cylindrical fishing rod holding tube is secured to a plate hingedly connected about a horizontal axis to a base in turn supported by earth engaging spikes. An arm on the plate closes a switch to energize an electrical audible signal device supported by the base in response to a fish strike. Bolt and spring means adjustably resist pivoting movement of the plate about its horizontal axis for normally maintaining the switch open.

3,713,132

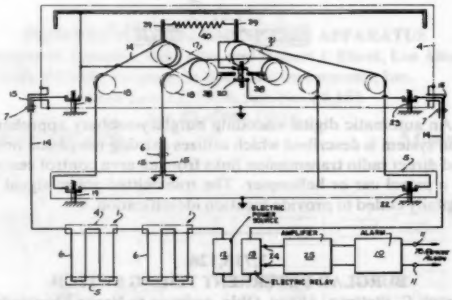
INTRUSION ALARM FOR WINDOWS AND OTHER OPENINGS

William Tonkowich; John A. Meditz, both of Franklin Lakes, and Paul Vignola, Parsippany, all of N.J., assignors to Safetech, Inc., Fairfield, N.J.

Filed Dec. 30, 1970, Ser. No. 102,593

Int. Cl. G08b 13/00, 13/08

U.S. Cl. 340—273 **13 Claims**

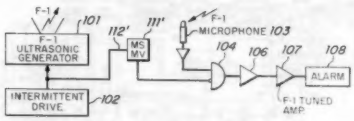


An alarm device for preventing an intruder from entering a window or door or other opening without sounding an alarm. The alarm comprises a series of electric wires arranged to extend across the opening between housings in a physical arrangement which prevents the passage of the intruder without moving one or more of the wires. An electrical alarm system is included which provides a signal upon the cutting or moving or short circuiting of any of the wires and which also signals an attempt to move, invade or otherwise tamper with the wire supporting housings.

3,713,133
RF AND SONIC SYSTEMS FOR PREVENTING SHOPLIFTING OF GOODS AND UNAUTHORIZED REMOVAL OF CAPSULES AFFIXED THERETO FOR PROTECTING GOODS

Robert L. Nathans, 36 Stag Drive, Billerica, Mass.

Filed Feb. 16, 1971, Ser. No. 115,274
Int. Cl. G08b *13/18*
U.S. Cl. 340—280 13 Claims

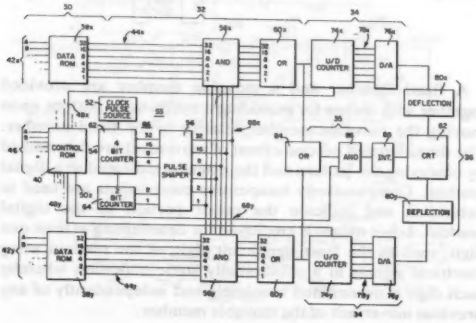


Capsules or tags are affixed to a plurality of goods kept within a storage area, which capsules produce an alarm indication upon unauthorized removal of the goods through an exit area. The capsules or tags bear the designation "Don't Remove-Electronic Alarm" and contain first and second resonant devices and are affixed to the goods by means of an ordinary safety pin. The first resonant device actuates an article removal alarm when the goods pass through the exit area, whereas the unauthorized opening of the safety pin in an attempt to remove the capsule in the storage area to defeat the system enables the second resonant device which in turn produces a capsule removal alarm in the storage area and as a result a greater deterrent is present with respect to theft of the goods and special unwieldy fastening devices such as rivets, requiring special measures for application and removal are eliminated. Additionally small and/or delicate goods may be protected, which goods would not be protected owing to the aforementioned rivets or special fastening devices. Sonic systems which may or may not produce a capsule removal alarm operate preferably in the ultrasonic range. An extended range capsule is particularly well adapted for protecting goods stored in a warehouse.

3,713,134
DIGITAL STROKE CHARACTER GENERATOR

Harry M. Chaney, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 16, 1970, Ser. No. 72,613
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A 5 Claims

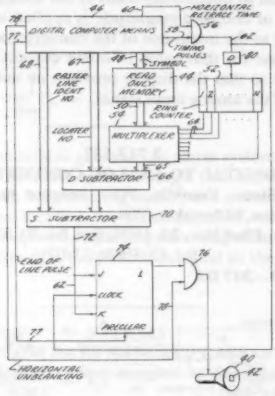


A system for generating characters by deflecting an electron beam over a screen having orthogonal X and Y axes. Beam deflection and modulation commands for each segment of each character are stored in read only memories. The deflection commands are read out to a binary rate multiplier after a character has been selected. The binary rate multiplier generates X and Y pulse trains having independently variable binary rates under the control of the deflection commands. The pulse trains are then applied to X and Y UP/DOWN counters and digital-to-analog converters to generate X and Y deflection signals in analog form having independently variable rates of change corresponding to the binary rates of the digital deflection signals. The polarity or direction of the rate of change is determined by deflection commands which control the direction of count in the UP/DOWN counters.

3,713,135
DIGITAL SYMBOL GENERATOR

Stanislaw Vincent Lazecki, Norwalk, Conn., assignor to United Aircraft Corp., East Hartford, Conn.

Filed May 24, 1971, Ser. No. 146,343
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A 1 Claim

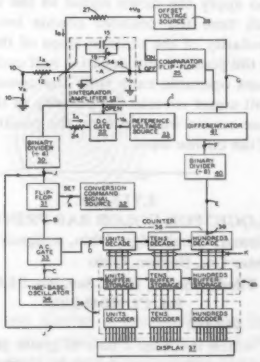


A digital symbol generator uses simple arithmetic operations performed by digital logic components to determine the raster lines on a cathode ray tube where it is desired to display video. Two arithmetic operations are performed digitally for each disjunctive segment of a symbol to predict whether or not a raster line about to be swept, or a part thereof, for which the operations were performed, is used in displaying the symbol.

3,713,136
ANALOG-TO-DIGITAL CONVERTERS

John Nagy, Jr., Union, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

Continuation of Ser. No. 661,924, Aug. 21, 1967, which is a continuation-in-part of Ser. No. 642,818, June 1, 1967. This application Sept. 16, 1970, Ser. No. 72,901
Int. Cl. H03k *13/02, 13/20*
U.S. Cl. 340—347 NT 11 Claims



An analog-to-digital converter of the dual slope integrating type operates without counter reset or input gating circuitry to

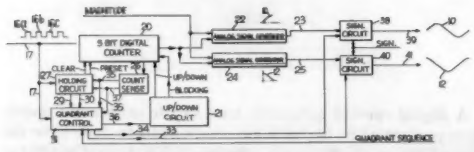
provide successive, accurate digital readouts representing the average magnitude of corresponding analog input signals. Provision is made to nullify a predetermined number of transient waveforms which may be produced as an undesired by-product of dispensing with such circuitry. The converter employs a buffer storage register to receive and store the digital contents of a counter, which contents represent the average magnitude of the analog input signal. The storage register provides a digital readout, typically in the form of a visual display, which persists at least for a time interval which starts at the termination of one complete analog-to-digital conversion cycle and extends to the termination of a succeeding conversion cycle. In accordance with yet another aspect of this invention to polarity reversals of the analog signal, an offset current of constant magnitude is applied as an additional input signal to the integrator of the converter and appropriate compensation for that value of offset current is provided by the counter so that the display provides an indication only of the value of the analog input signal.

3,713,137

DIGITAL TO ANALOG CONVERTER

David W. Stone, Franklin, Wis., assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Nov. 23, 1970, Ser. No. 91,826
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 DA **50 Claims**



A digital-to-analog converter converts a digital pulse train into a sine analog voltage and a cosine analog voltage whose frequency is proportional to the pulse repetition rate. A binary digital counter receiving the pulses counts up and down between zero and a preselected upper limit count in response to up and to down input signals respectively. A first analog signal generator generates one voltage step of one quadrant of a staircase sine voltage wave for each discrete count stored in the counter, and a second analog signal generator derives one voltage step of one quadrant of a staircase cosine voltage wave for each discrete count stored in the counter. Up/down circuit means operable after the counter has counted backwards to zero count applies the up signal to the counter and is also operable after the counter has proceeded forward to the upper limit count to apply the down signal to the counter. Means operable each time the counter counts backward to zero reverse the polarity of the voltage steps of the staircase sine wave to form the positive and negative half cycles of the sine w ave, and means operable each time the counter proceeds to the upper limit count reverse the polarity of the voltage steps of the staircase cosine wave to form the positive and negative half cycles of the cosine wave.

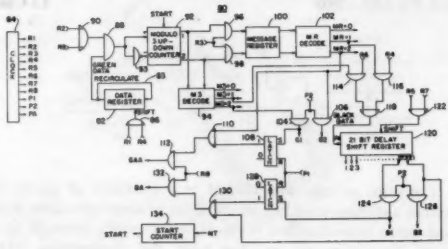
3,713,138

LOGIC FOR COLOR BAR PRINTER

Donald J. Girard, Cambridge, Ohio, assignor to The National Cash Register Co., Dayton, Ohio

Filed June 30, 1970, Ser. No. 51,075
Int. Cl. H04l *3/00*
U.S. Cl. 340—347 DD **12 Claims**

A printer, which includes a pair of green printing elements and a pair of black printing elements, causes a sequence of green, black, and white colored bars to exist on a tag, where the green and black bars are printed and the white bars are the tag color resulting from a lack of printing. The tag is moved through the printer in discrete steps of two bar widths at a time, so that two new areas of the tag are beneath each pair of printing elements after each discrete movement. Signals are then applied to those printing elements which are to then print bars. A ribbon, which is associated with each pair of printing elements, is moved one bar width each time a print signal is applied to the pair of printing elements. This movement occurs after the leading one of the printing elements prints and before the trailing one of the printing elements prints. Logic circuitry is also included for converting a binary code into signals representing the colored bar code and for providing necessary signals to the printing elements and ribbons. The code-converting circuitry uses a module three up-down counter, and the then-existing count in the counter represents the then-required color bar.

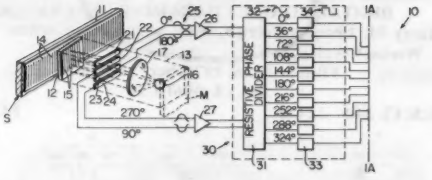


3,713,139

APPARATUS AND METHOD OF DETERMINING DISPLACEMENTS

Norman R. Sanford, and Juris Vikmanis, both of Dayton, Ohio, assignors to The Bendix Corporation

Filed Jan. 25, 1971, Ser. No. 109,345
Int. Cl. G08c *9/06*
U.S. Cl. 340—347 P **17 Claims**



A fixed member and a movable member are provided together with means for providing a cyclic wave pattern upon moving the movable member relative to the fixed member. The direction and precise extent of movement are determined by observing the pattern and the extent is indicated as a digital readout. Comparatively inexpensive components are used to determine and indicate the major portion of the digital readout. Logic means is employed for determining at least one digit, such as the least significant digit, of the readout using electrical signals in a substantially static condition whereby such digit is determined absolutely and independently of any previous movement of the movable member.

3,713,140

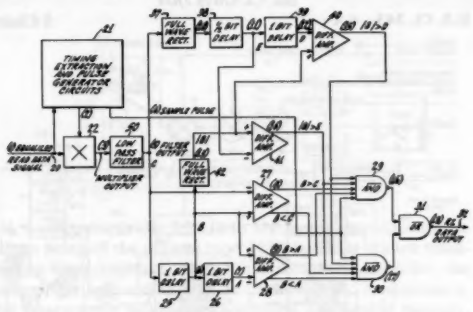
DECODER FOR DELAY MODULATION SIGNALS

George John Meslener, Acton, Mass., assignor to RCA Corp.

Filed Oct. 8, 1970, Ser. No. 79,190
Int. Cl. H03k *13/24*
U.S. Cl. 340—347 DD **1 Claim**

A decoder is disclosed for a binary bit stream in which a transition occurs at the middle of a bit cell containing a "1," and a transition occurs at the partition between adjacent bit

cells containing "0's." A reference wave derived from the bit stream and having a period equal to a bit-cell width, and the binary bit stream, are applied to a multiplier to produce a product wave. The product wave is translated by integrate-and-dump circuits, or by a low-pass filter, to a modified product wave in which low-frequency components are predominant. A first comparator means produces a "1" output when the portion of the modified product wave corresponding to a bit cell is more positive or more negative than the portions of the modified product wave corresponding to both the preceding and following bit cells. A second comparator means produces a "1" output when the portion of the modified product wave corresponding to a bit cell has a larger absolute value than the portion of the modified product wave corresponding to the unit preceding the center of the bit cell and the unit following the center of the bit cell.

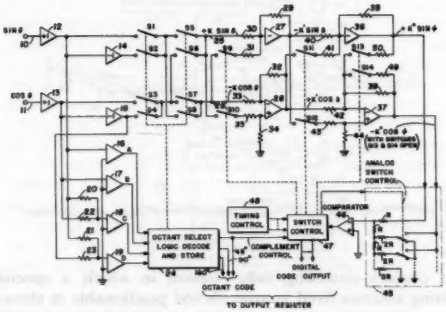


3,713,141

SYNCHRO-TO-DIGITAL CONVERSION METHOD AND APPARATUS

Roger K. Higgins, and Andrew T. Sheets, both of Silver Spring, Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed May 21, 1971, Ser. No. 145,660
Int. Cl. H03k *13/17*
U.S. Cl. 340—347 SY **13 Claims**



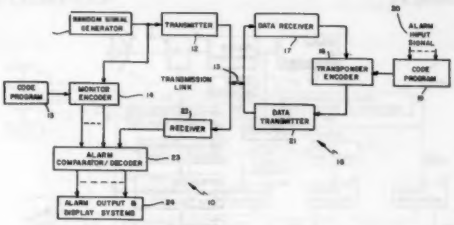
A method and apparatus for converting input synchro data, received in the form of a pair of signals representing, for example, the sine and cosine of a synchro shaft angle whose quadrant is predetermined, into a weighted binary number accurately identifying the synchro angle. Circuitry performs two successive steps of angle subtraction from the input synchro angle until a resultant angle between 0° and 11.25° is obtained for which an accurate linear approximation can be made.

3,713,142

ALARM SYSTEM

Edward H. Getchell, Carlisle, Mass., assignor to Signatron, Inc., Lexington, Mass.

Filed Jan. 17, 1972, Ser. No. 218,360
Int. Cl. G08b *26/00*
U.S. Cl. 340—408 **25 Claims**



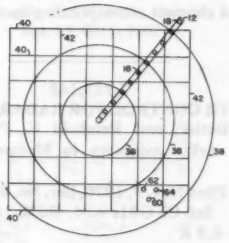
This invention relates generally to alarm systems and, more particularly, to an alarm system using a two-way communication link between a monitoring station and a transponder station at a remote location the alarm status of which is being monitored, such system employing encoding techniques based on the generation of a truly random signal at the monitoring station.

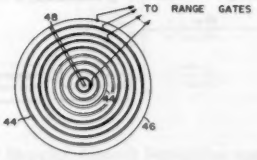
3,713,143

LOW DATA RATE DISPLAYS

Daniel Blitz, Boston, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed July 6, 1970, Ser. No. 52,238
Int. Cl. G01s *7/26*
U.S. Cl. 343—5 R **8 Claims**



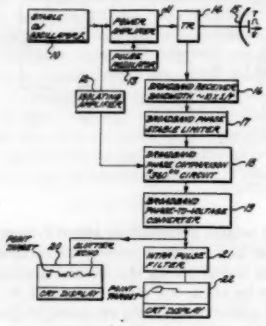


A low data rate display is provided using light sources to represent range, and mechanical scanning of azimutn. In one embodiment a rotating arm synchronized to a rotating antenna has a number of light sources mounted along the length thereof each of which corresponds to a particular range and each of which is coupled to a particular range gate.

3,713,144
PHASE SIGNATURE RADAR

Carlyle J. Letten, Acton, Mass., and William B. Goggins, Jr., Winchester, Mass., assignors to the United States of America as represented by the Secretary of Air Force

Filed Nov. 22, 1968, Ser. No. 784,990
Int. Cl. G01s 9/02
U.S. Cl. 343—5 R 3 Claims

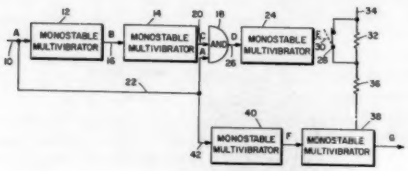


A radar method and system of distinguishing radar echoes of discrete and point targets such as moving and motionless aircraft, trucks, etc., from reflections from distributed targets such as the earth's surface, the radar echoes resulting from a succession of single pulses transmitted from a single antenna. The electrical phase within the returning radar echoes is measured by means of a coherent CW oscillator operating at the frequency of the transmitted radar signal. The measurement of phase as a function of time results in a fixed or stationary phase measurement for point targets distinguishable from the variable phase changes corresponding to distributed or multiple targets.

3,713,145
PULSE WIDTH CONTROL FOR RADAR TRANSPONDERS

Thomas A. Butler, and Reinhold G. Pflugfelder, both of Scottsdale, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 9, 1970, Ser. No. 87,908
Int. Cl. G01s 9/56; H03k 3/284
U.S. Cl. 343—6.8 R 5 Claims

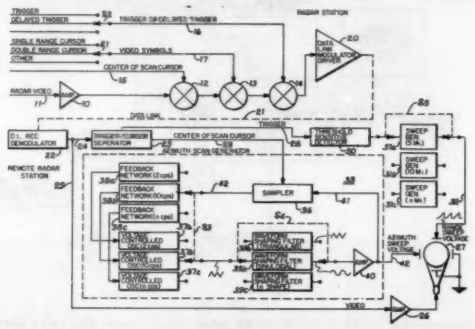


A radar transponder is disclosed which discriminates between the lengths of the pulses received and retransmits a pulse of one length upon receipt of a pulse of a short time duration and retransmits a pulse of a greater length upon receipt of a pulse of a longer time duration. The discriminator sets an output monostable multivibrator to produce the long pulse upon receipt of the long interrogation pulse and the output monostable multivibrator is then triggered by a delayed pulse that is responsive to the received pulse.

3,713,146
CIRCUITRY FOR REMOTELY DISPLAYING RADAR IMAGERY USING A SINGLE DATA CHANNEL

John J. Carroll; Calvin A. Hughey, both of Indianapolis, and Charles W. May, Martinsville, all of Ind., assignors to the United States of America as represented by the Secretary of the Navy

Filed Jan. 29, 1971, Ser. No. 110,984
Int. Cl. G01s 7/04
U.S. Cl. 343—6 A 5 Claims

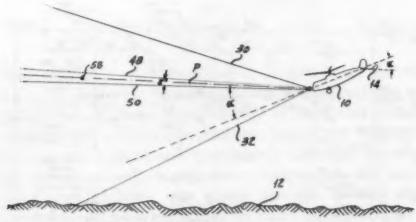


A circuit for remotely displaying radar imagery from the radar circuits at a radar receiving station to a remote point by a single telemetry channel, the circuit having mixers to mix desired video signals on the pedestal level to form the composite video consisting of the blanking level, the pedestal level, and the saturation level, which desired video signals are demodulated and separated at the remote station and applied to a sampler circuit of an azimuth scan generator or phase lock loop and a sweep generator coupled to the remote display tube to display the desired video signals.

3,713,147
OBSTACLE DETECTION WITH CROSSED FAN BEAM

Lawrence Chanzit, Stamford, Conn.; Herbert Green, Elmsford, N.Y., and Huw C. Morgan, Bedford, England, assignors to United Aircraft Corp., East Hartford, Conn.

Filed Dec. 23, 1970, Ser. No. 100,853
Int. Cl. G01S 9/02
U.S. Cl. 343—7 A 8 Claims

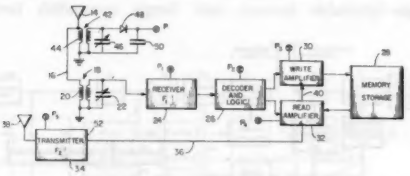


An obstacle-detecting radar system in which a special receiving antenna fixed in azimuth and positionable in elevation provides a fan-shaped receiving pattern having a wide azimuthal extent and a very narrow elevational extent for receiving reflected radiation originating in a beam transmitted by a terrain radar transmitter which is fixed in elevation and scanned in azimuth and which transmits a fan-shaped radiation pattern having a narrow azimuthal extent and a wide elevation extent to provide the effect of a pencil beam radar which sweeps across the flight path in azimuth in front of the aircraft to provide a signal which actuates an alarm or the like in response to radiation reflected by an obstacle in the flight path.

3,713,148
TRANSPONDER APPARATUS AND SYSTEM

Mario W. Cardullo, Rockville, and William L. Parks, III, Bethesda, both of Md., assignors to Communications Services Corporation, Inc., Rockville, Md.

Filed May 21, 1970, Ser. No. 39,309
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 R **7 Claims**

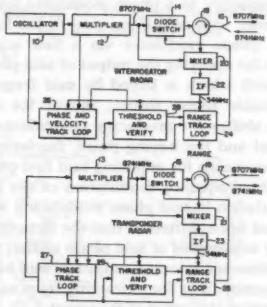


A novel transponder apparatus and system is disclosed, the system being of the general type wherein a base station transmits an "interrogation" signal to a remote transponder, the transponder responding with an "answerback" transmission. The transponder includes a changeable or writable memory, and means responsive to the transmitted interrogation signal for processing the signal and for selectively writing data into or reading data out from the memory. The transponder then transmits an answerback signal from the data read-out from its internal memory, which signal may be interpreted at the base station. In the preferred inventive embodiment, the transponder generates its own operating power from the transmitted interrogation signal, such that the transponder apparatus is self-contained.

3,713,149
COOPERATIVE RADAR SYSTEM

Weston G. Bruner, Adelphi; Johnnie L. Pearson, Severna Park; George C. Reeder, Jr., Pasadena; Alfred F. Gaheen, Jr., Glen Burnie, all of Md.; Elberson D. Green, Santa Ana, Calif., and Robert B. Hughes, College Park, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 665,550, Sept. 5, 1967, abandoned. This application Sept. 5, 1969, Ser. No. 855,621
Int. Cl. G01s 9/14
U.S. Cl. 343—7 A **12 Claims**

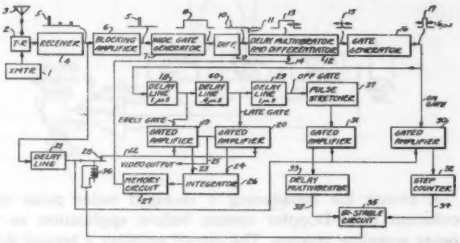


A PRF ranging doppler radar system comprising a frequency-phase locked interrogator and a transponder radar wherein lock up occurs in a CW mode while range is determined in a pulse mode by tracking the pulse repetition frequency (PRF) in respective servo loops which match the pulse width and travel time distance between the radars. Identical range track loops exist in the interrogator and transponder and range error is derived by comparing the center of the received pulse with the center of a pair of split range gates. When the range error is nulled, both radars transmit with the same PRF which is a function of the range separation between the two.

3,713,150
AUTOMATIC RANGE RATE MEMORY SWITCH FOR RADAR SYSTEMS

James R. Siconolfi, Fort Wayne, Ind., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Aug. 5, 1959, Ser. No. 831,922
Int. Cl. G01s 9/02
U.S. Cl. 343—7.3 **5 Claims**

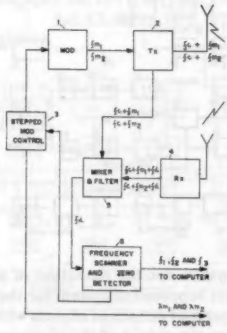


A radar system employing automatic range tracking including means for automatically switching the range tracking loop open whenever a video signal from any source occurs immediately prior to the target signal; and to hold the loop open until the disturbing signal passes out of range. The advantage of this automatic switching is that it operates fast enough to give protection over sweep jamming signals.

3,713,151
LIGHTWEIGHT DOPPLER NAVIGATOR

Harvey Kofsky, Montreal, Quebec, Canada, assignor to Canadian Marconi Company, Montreal, Quebec, Calif.

Filed Oct. 12, 1970, Ser. No. 79,993
Claims priority, application Canada, Oct. 14, 1969, 64,864
Int. Cl. G01s 9/02
U.S. Cl. 343—7.5 **6 Claims**

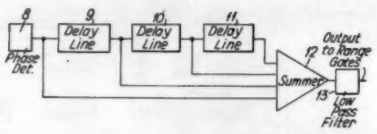


An FM/CW Doppler Aircraft Navigation system which detects Doppler shift frequencies associated with Altitude holes to compute aircraft flight parameters. A transmitter is modulated at one frequency and the Doppler shift associated with the *n*th order altitude hole is detected. The modulating frequency is then changed and Doppler shifts associated with the *n*th and $(n+1)$th order altitude holes of the second modulating frequency are detected. The above data supplies enough information to compute aircraft velocity and altitude. In a further embodiment the *n*th order altitude hole at zero Doppler frequency, is also detected, whereby it is possible to compute ground slope in addition to aircraft parameters.

3,713,152
CIRCUIT FOR MATCHING THE RADAR PULSE DURATION WITH THE RANGE GATE WIDTH

Michel G. M. Castets, Meudon; Jean-Marie H. Colin, and Jean-Claude A. Eebuisser, both of Paris, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 16, 1970, Ser. No. 98,582
Claims priority, application France, Dec. 19, 1969, 6944165
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 6 Claims

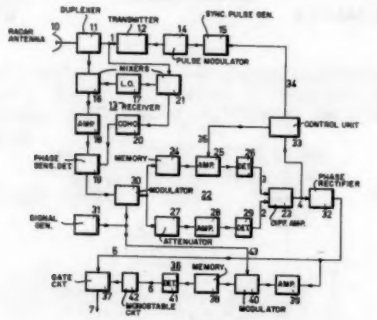


A circuit for broadening a received radar pulse in a coherent pulse-Doppler system before application to the range sampling process. The circuit employs a tapped delay line or a series of delay lines in the signal channel to accomplish the broadening without significant signal-to-noise ratio deterioration while eliminating pulse "straddle" loss in the corresponding incremental range samplings.

3,713,153
PULSE RADAR SYSTEM FOR DETECTING MOVING TARGETS

Yftinus Frederik van Popta, Hengelo, Netherlands, assignor to N. V. Hollandse Signaalapparaten, Hengelo, Netherlands

Filed June 1, 1970, Ser. No. 42,232
Claims priority, application Netherlands, June 6, 1969, 6908606
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 1 Claim

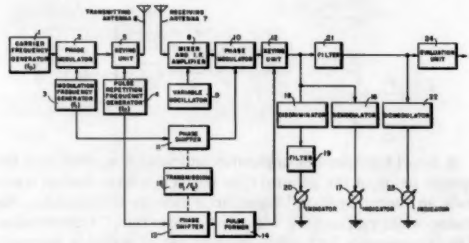


A pulse radar system for the detection of moving targets, comprising a clutter suppression system for the elimination of echoes of fixed objects of echoes of objects with smaller radial speeds connected to the output of the receiver and a suppression system for random jamming signals connected to the output of the clutter suppression system. The clutter suppression system comprises two signal processing channels connected to a difference amplifier; one channel having at least one memory for the introduction of a fixed delay. The suppression system for random jamming signals comprises a signal processing channel and a non-processing channel connected to a gate circuit and a memory in one of the two channels for delaying the echoes passing through the channel as well as any jamming signals relative to signals passing through the other channel with a duration which is a number of times one pulse repetition period greater than the duration of the maximum delay to which the signals in the clutter suppressor are subjected.

3,713,154
RADAR

Helmut Kummer, Ulm/Donau, Germany, assignor to Telefunken Patentverwertungs-G.m.b.H., Ulm-Donau, Germany

Filed Aug. 10, 1961, Ser. No. 131,963
Claims priority, application Germany, Aug. 20, 1960, T 18878
Int. Cl. G01s 9/44
U.S. Cl. 343—9 18 Claims



1. In an apparatus for locating targets by a radar system operating with very short electromagnetic waves, particularly for locating low-flying targets so that the antenna radiation pattern of said system touches ground, wherein a speed selection is combined with a distance selection, the line interval of the operating spectrum being greater than $2(v_{max}/\lambda)$, where v_{max} = the maximum radial speed of the target relative to the system and λ = the operating wave length of the system, the combination which comprises:

means for phase modulating a carrier frequency f_o with a modulation frequency f_1 for producing a frequency spectrum containing substantially only the frequencies $f_o - f_1$, and f_o, and $f_o + f_1$; means for pulse modulating said frequency spectrum with a frequency f_2; means for transmitting the thus-modulated frequency spectrum; means for converting the echo signal, which if it has been reflected by a target which is travelling radially with respect to the transmitter antenna has been frequency shifted relative to the transmitted signal by an amount corresponding to the Doppler frequency, to an intermediate frequency; means for applying the thus-obtained intermediate frequency to a phase modulator for phase modulating the former with said frequency f_1, the latter being applied to said phase modulator via a first adjustable phase shifter; means for applying the output of said phase modulator to a keying unit which is keyed by said frequency f_2 via a second adjustable phase shifter; means for adjusting said second phase shifter for producing coincidence between the received signal and the keying pulse, the latter serving as a selection pulse; means for adjusting said first phase shifter for neutralizing the frequency modulation of the transmitter by counter-modulation in said phase modulation which counter-modulation has been shifted so that the distance of the target is obtained by adjustment of said phase shifter; and means for applying the distance selected output of said keying unit to a Doppler frequency filter for extracting from said signal intelligence concerning the speed of the target.

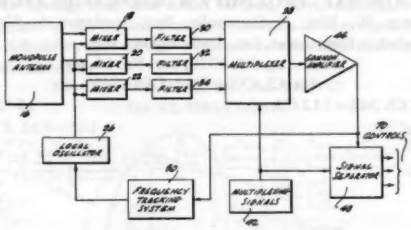
3,713,155
MONOPULSE RADAR RECEIVER

Richard M. Jaffe, Inglewood, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 23, 1958, Ser. No. 744,628
Int. Cl. G01s 9/22
U.S. Cl. 343—16 M 8 Claims

1. A receiver comprising: a monopulse antenna; a sum and difference network coupled to said antenna for developing a sum signal and first and second difference signals, said signals

having relative amplitudes indicative of target information; first and second modulators coupled to said network for receiving said first and second difference signals; an oscillator; first phase shifting means coupled between said oscillator and said first modulator for controlling said first modulator to phase shift said first difference signal and to modulate said first difference signal into first sideband signals; second phase shifting means coupled between said oscillator and said second modulator for controlling said second modulator to phase shift said second difference signal and to modulate said second difference signal into second sideband signals;



summing means coupled to said first and second modulators for receiving said phase shifted first and second sideband signals from said first and second modulator and coupled to said network for receiving said sum signal and for combining said phase shifted signals and said sum signal into a common signal; an amplifier coupled to said summing means; and detecting means coupled to said amplifier and coupled to said first and said second phase shifting means for responding to said common signal to develop signals indicative of the relative amplitudes of said sum and difference signals developed in said network.

3,713,156

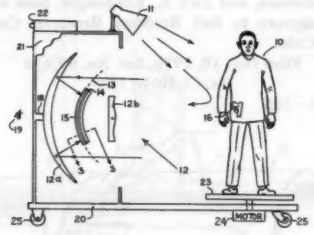
SURFACE AND SUBSURFACE DETECTION DEVICE

Robert G. Pothier, Oak Hill Drive, Amherst, N.H.

Filed Oct. 12, 1970, Ser. No. 80,066

Int. Cl. G01s *9/02, 9/64*

U.S. Cl. 343—17 **9 Claims**



Detector apparatus in which the target area is illuminated by microwave energy in the millimeter range. A microwave lens element focuses the reflected millimeter waves to a focal plane. A microwave to thermal converter is disposed in the focal plane to convert the reflected microwave images to thermal images. A liquid crystal display or an IR area detector, such as a line scan unit is employed to convert the thermal images to a visible display of images in the target area.

3,713,157

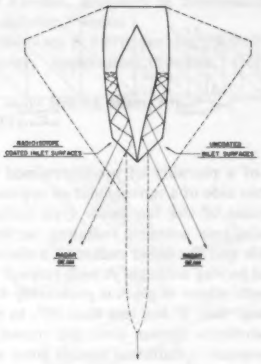
ENERGY ABSORPTION BY A RADIOISOTOPE PRODUCED PLASMA

Henry August, Sepulveda, Calif., assignor to North American Aviation, Inc.

Filed July 31, 1964, Ser. No. 387,551

Int. Cl. G01s *7/36*

U.S. Cl. 343—18 **16 Claims**



This invention relates to an arrangement for producing an ionized plasma adjacent a surface and in particular it relates to providing a body with a coating capable of injecting kinetic energy into an adjacent gaseous medium thereby reducing the frictional drag of the body when traveling through such a medium, as well as being capable of producing an ionized plasma sheath that will absorb or attenuate the transmission of eletromagnetic and longitudinal type energy therethrough.

3,713,158

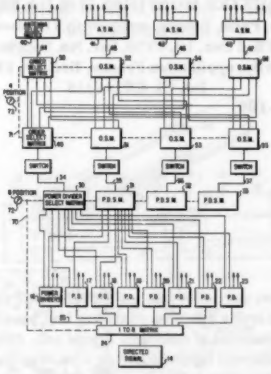
DIGITAL FEED SYSTEM FOR ELECTRONIC ANTENNA ARRAY

Fred E. Burnham, Silver Spring, Md., assignor to Litton Systems, Inc., College Park, Md.

Filed April 26, 1971, Ser. No. 137,320

Int. Cl. H01q *3/26*

U.S. Cl. 343—100 SA **5 Claims**

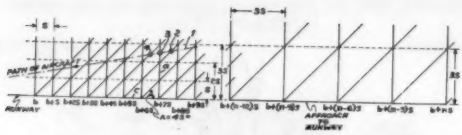


A scanning antenna array having plural antenna units and a digital feed system for reversibly energizing plural ones of said units in unison with groups of different fixed amplitude signals. The feed system includes fixed power dividers for generating (or receiving) the plural signals, and a multiple tier switching system for applying said different groups of signals to preselected groups of said units in a preselected or desired order.

3,713,159
AIRCRAFT LANDING SYSTEMS

Murray Hoffman, Livingston, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 14, 1970, Ser. No. 63,812
Int. Cl. G01s 1/02
U.S. Cl. 343—102 13 Claims

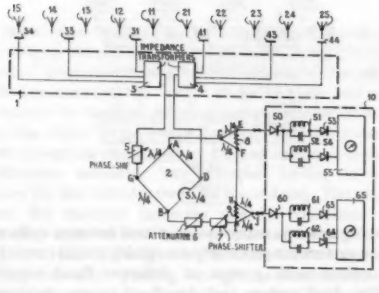


From each of a plurality of predetermined spaced points along at least one side of a runway and an approach to the runway two antennas of the fan beam type radiate modulated radiation signals, one antenna radiating vertical modulated radiation signals and the other radiating a slanted modulated radiation signal having an angle A with respect to the runway and the approach, where angle A is preferably 45°, but may be any value greater than 5° but less than 90°, to provide a non-orthogonal coordinate system over the runway and the approach. The respective radiation signals from each point are made distinctive, such as by a different carrier signal frequency, and the modulation, such as binary coded information, gives the distance of the associated point from a reference point, such as the desired touchdown point on the runway. A receiving device carried by a landing aircraft will be able to display (1) the distance to touchdown by recovering the distance of the associated spaced point from touchdown of an intercepted vertical radiation signal and (2) the height of the aircraft above the runway and the approach by subtracting the distance of the associated one of the spaced points from touchdown obtained from an intercepted slanted radiation signal from the distance of the associated one of the spaced points from touchdown obtained from an intercepted vertical radiation signal adjacent the intercepted slanted radiation signal, if angle A is equal to 45°. If angle A is other than 45°, the resultant difference signal obtained by the above described subtraction is multiplied by the value of the tangent of angle A.

3,713,160
TRANSMITTER MONITORS FOR ILS BEACONS

Henri Becavin, Paris, France, assignor to Thomson-CSF

Filed Dec. 10, 1970, Ser. No. 96,896
Claims priority, application France, Dec. 19, 1969, 6944102
Int. Cl. G01s 1/16
U.S. Cl. 343—109 5 Claims

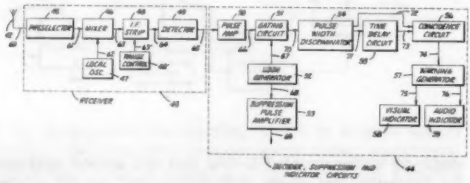


In a localizer beacon of the ILS system, analog signals derived from the two lateral antennas by means of probes coupled thereto are phase-shifted by equal angles, disregarding multiples of 2 π. The analog signals respectively corresponding to the lateral antennas are separately added. The two sum signals thus obtained are added together to supply the HF signal representative of the radiation in the reference plane containing the center line of the runway. They are also subtracted from each other to supply a second HF signal representative of the variation of the d.d.m. as a function of the azimuth. This second signal is attenuated and phase-shifted, and part of the first HF signal added thereto, so that any variation of the d.d.m. in the resultant signal indicates a variation of the second signal.

3,713,161
AIRCRAFT PROXIMITY WARNING INDICATOR

Elmore W. Rice, Indianapolis, Ind., assignor to General Aviation Electronics, Inc., Indianapolis, Ind.

Filed Aug. 25, 1970, Ser. No. 66,684
Int. Cl. C08g 5/04; G01s 9/56
U.S. Cl. 343—112 CA 15 Claims

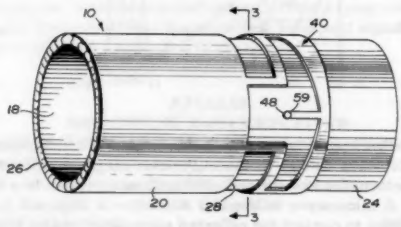


An apparatus carried aboard an aircraft to indicate the proximity of intruding aircraft equipped with transmitting air traffic control transponders. A receiver acquires the transponder signal of the intruding aircraft and relays the signal to a decoder circuit. A gating circuit within the decoder circuit opens to allow the transponder signal to pass to a pulse width discriminator which excludes all signals not having the unique pulse width of a transponder signal. A generator provides a pulse for simultaneously operating the gating circuit and suppressing the transponder and distance measuring equipment carried abroad the aircraft equipped with the proximity indicator. A time delay circuit and a coincidence circuit are connected to the pulse width discriminator and allow only signals to pass to a warning generator which have the unique time period of a transponder signal. Visual and audio indicators are connected to the warning generator for indicating the receipt by the warning generator of an air traffic control transponder signal.

3,713,162
SINGLE SLOT CAVITY ANTENNA ASSEMBLY

Robert E. Munson, and Jack K. Krutsinger, both of Boulder, Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Dec. 18, 1970, Ser. No. 99,434
Int. Cl. H01q 1/28
U.S. Cl. 343—705 14 Claims



A thin flexible wrap-around antenna assembly, particularly suitable for use in conjunction with a propelled vehicle such as

a missile, is disclosed and generally includes a first or inner cylindrical thin conductor that can be flush-mounted on the skin of the propelled vehicle and a second concentrically positioned outer cylindrical thin conductor having an axial length which is equal to one-quarter wavelength at the anticipated operating frequency of the antenna. The conductors are electrically connected at adjacent transverse edges so as to define a one-quarter wavelength open-ended coaxial cavity which is connected to a transmitter or receiver by a combination electrical signal feed and impedance matching assembly.

3,713,163

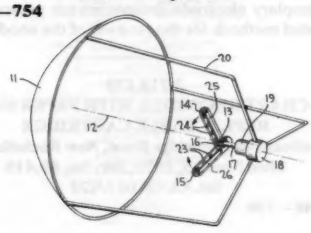
PLURAL BEAM ANTENNA

George C. Keller, Hyattsville, Md.; Marvin S. Maxwell, Silver Spring, Md., and Louis R. Dod, Silver Spring, Md., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 22, 1971, Ser. No. 200,717

Int. Cl. H01q *3/26*

U.S. Cl. 343—754 **8 Claims**



An antenna capable of deriving a plurality of beams about a single boresight axis includes a focusing means, such as a parabolic reflector or a lens. Plural arrays, each including plural radially aligned antenna elements extending from the boresight axis, are located in proximity to a focal point for the focusing means. The elements of the plural arrays are independently excited. Each of the arrays is independently rotated about the boresight axis.

3,713,164

STEERABLE ANTENNA

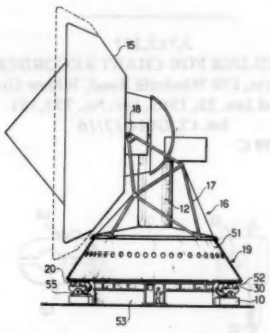
Georges Foury, Le Plessis-Robinson, France, assignor to Compagnie Generale d'Automatisme, Paris, France

Filed Dec. 23, 1970, Ser. No. 100,944

Claims priority, application France, Dec. 23, 1969, 6944625; Oct. 23, 1970, 7038392

Int. Cl. H01q *3/00*

U.S. Cl. 343—766 **4 Claims**



A telecommunication antenna comprising a reflector rests on foundations through a support assembly comprising a metal structure to which the reflector is fixed at the upper end, and a circular ring at the lower end. The ring rests on the foundations by means of rollers whose axes are horizontal and connected to the foundations. The ring rotates about the horizontal axis of the antenna by friction from drive rollers whose axes are vertical and supported by foundations.

3,713,165

ANTENNA FOR STRIP TRANSMISSION LINES

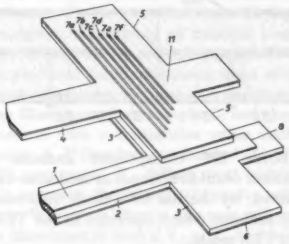
Rolf Ove Esbjorn Lagerlof, Vastra Frolunda; Lennart Stig Sjoholm, Jakobsberg, and Thomas Lars-Gustav Svensson, Vaxjo, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Oct. 5, 1970, Ser. No. 77,947

Claims priority, application Sweden, Oct. 23, 1969, 14507/69

Int. Cl. H01q *13/10*

U.S. Cl. 343—771 **5 Claims**



An antenna for strip transmission lines has slots of different lengths in the planar outer conductors. The slots are situated so that they intersect the planar inner conductor and each slot is matched for transmission or reception of signals with a certain frequency by the length of the slot and the distance from the slot to the end of the planar inner conductor. In one embodiment of the antenna the end of the planar inner conductor is formed to match the distances to the individual slots. In another embodiment of the antenna the slots merge to form only one cut-out in the planar outer conductor.

3,713,166

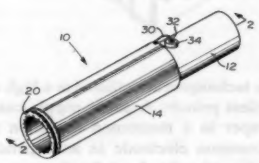
FLUSH MOUNTED ANTENNA AND RECEIVER TANK CIRCUIT ASSEMBLY

Robert E. Munson; Jack K. Krutsinger, and Jerry H. Polson, all of Boulder, Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Dec. 18, 1970, Ser. No. 99,484

Int. Cl. H01q *9/16*

U.S. Cl. 343—792 **10 Claims**



An assembly for transmitting and receiving communication signals is disclosed and generally includes a first or inner cylindrical conductor, the length of which is substantially equal to one-half wavelength at a predetermined operating frequency and a second concentrically positioned outer cylindrical conductor, the length of which is substantially equal to one-half that of the inner conductor. The conductors are electrically connected at adjacent transverse edges so as to define a one-quarter wavelength open-ended coaxial cavity. A coaxial line, connected to the conductors at the opening of the cavity, is provided for joining the device to a transmitter or receiver. The device, constructed in this manner, electrically becomes a

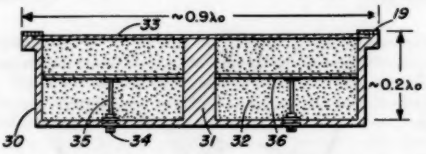
half-wave dipole antenna operating at the aforementioned predetermined frequency. In addition, the assembly may include a third cylindrical conductor which is also positioned concentrically about the first conductor and which operates at a second predetermined frequency as a second half-wave dipole antenna.

3,713,167

OMNI-STEERABLE CARDIOID ANTENNA

Sidney David, Commack, N.Y., assignor to the United States of America as represented by the Secretary of the Navy

Filed Aug. 5, 1971, Ser. No. 169,284
Int. Cl. H01q *21/24*
U.S. Cl. 343—797 **12 Claims**



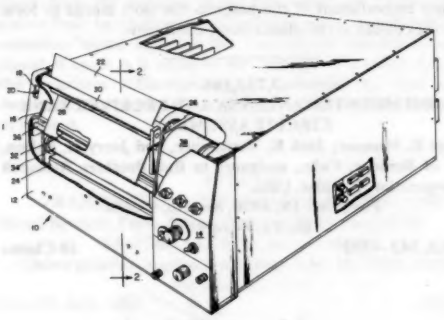
An airborne IFF transponder antenna system which produces either omnidirectional or steerable-cardioid azimuth plane patterns, by the use of a flush dual-mode coaxial-line type cavity radiator which operates in the TEM mode and in the crossed TE_{11} mode.

3,713,168

HIGH SPEED IMPACTLESS DATA PRINTER

Arthur Yeaton Baker, Los Angeles, Calif., assignor to Datametrics Corporation, Van Nuy, Calif.

Filed May 27, 1970, Ser. No. 40,892
Int. Cl. G01d *15/06*, *15/24*
U.S. Cl. 346—74 E **19 Claims**



Electrolytic techniques are utilized in a high speed alpha numeric, impactless printer. A paper supply cassette maintains conductive paper in a moistened condition and includes a replaceable common electrode as an expendable item. Resistance detecting circuits check for the presence of paper of suitable conductivity before printing is enabled.

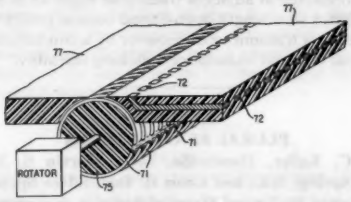
3,713,169

ELECTRODE CONFIGURATION FOR ELECTROLYTIC PRINTING

Dennis R. Turner, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 29, 1969, Ser. No. 861,746
Int. Cl. G01d *15/06*
U.S. Cl. 346—74 E **2 Claims**

To make possible high-speed electrolytic printing, an electrode arrangement is necessary which will permit the recording sheet to be transported past the writing electrodes at rates greater than 1-inch per second. The disclosed arrangement places a linear array of electrode pairs across the width of the recording sheet with the anode and the cathode electrodes of each pair on the same side of the recording sheet and without



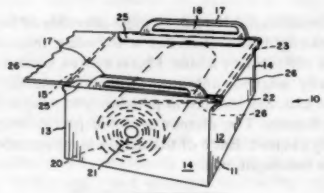
a backing plate or roller on the other side. In addition to easing the otherwise stringent mechanical tolerances on the system and the drag on the recording sheet, this arrangement eliminates printing through and could permit printing on both sides. Exemplary electrode geometries are presented, including suggested methods for the renewal of the anode.

3,713,170

STRIP-CHART RECORDER WITH PAPER SUPPLY IN REPLACEABLE CARTRIDGE

Harry Kaufman, 44 Highridge Road, New Rochelle, N.Y.

Filed Nov. 13, 1970, Ser. No. 89,419
Int. Cl. G01d *15/28*
U.S. Cl. 346—136 **10 Claims**



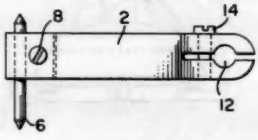
A strip-chart recorder having a paper supply, in roll or z-fold, housed in a replaceable cartridge for easy insertion and removal from the recorder is described. The paper drive means and writing stylus are located in the fixed parts of the recorder. The cartridge includes a back-up surface over which the paper is fed while the stylus writes on the paper. A lid which holds the cartridge in place includes an idler roller for cooperation with the paper drive means, and a cutter by means of which paper sections can be torn off.

3,713,171

PENHOLDER FOR CHART RECORDERS

Abner I. Schepartz, 170 Windmill Road, Willow Grove, Pa.

Filed Jan. 22, 1969, Ser. No. 793,151
Int. Cl. G01d *15/16*
U.S. Cl. 346—139 C **1 Claim**



An improved device for holding lettering pens on chart recorders that is pivotally connected to the recorder and accommodates a self cleaning lettering pen having an integral ink well that requires no remote ink supply or siphon line.

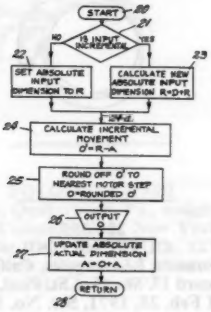
ERRATUM

For Class 444—1 see:
Patent No. 3,712,975

3,713,172
METHOD OF MINIMIZING ERROR IN INCREMENTAL WHOLE UNIT POSITIONING FROM DATA HAVING FRACTIONAL UNITS

Peter Senak, Jr., Bristol, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed July 29, 1970, Ser. No. 59,288
Int. Cl. G05b 19/18; G06b 15/46
U.S. Cl. 444—1 8 Claims



A method of programming a computer to provide an output of the incremental distance from one location to another in whole units with a minimum of error when at least some input distances are expressed in whole and fractional units with the dimensions of the last output and input locations being maintained in absolute units and their difference being outputted to the nearest whole unit for each incremental distance.

3,713,173
METHOD OF COLOR MATCHING WITH MORE THAN THREE COMPONENTS

Eugene Allen, Bethlehem, Pa., and Edwin Ira Stearns, Westfield, N.J., assignors to American Cyanamid Company, Stamford, Conn.

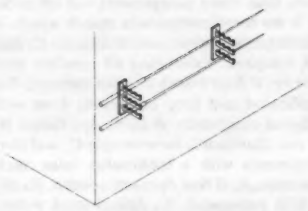
Filed April 14, 1971, Ser. No. 134,078
Int. Cl. G01j 3/46; G06f 7/00
U.S. Cl. 441—1 3 Claims

Color matches on specially programmed digital computers, requiring more than three components will often be required where there is no three-component match which is a match under two illuminants, for instance illuminant C, daylight, and illuminant A, tungsten. Examining all possible combinations of four colors or, if four colors are not enough, five, is enormously complicated and time consuming even with modern high speed digital computers. A three dye match is therefore made under one illuminant, for example C, and then a match of four components with a tristimulus value such as X of another illuminant, A. If five dyes are needed, Z_A of the target color is the fifth parameter. X_A differs most widely from X_C and therefore is normally the fourth tristimulus value chosen to make a match. When it is chosen, the pair will usually be a better match in illuminant A than if Y_A or Z_A had been chosen, but an improvement of some magnitude is found regardless of which fourth tristimulus value is used. A shortcut determines two three-dye combinations which have two dyes in common. The four dyes in these combinations make a four-dye match. Another shortcut to eliminating impossible or unsatisfactory matches is that if a three-dye formula gives an X_A smaller than the X_A of the target color and the other member of the pair of three-dye formulas also gives an X_A that is smaller than the target color, an improved match is impossible. It is necessary for one three-dye formula to have a lower X_A and the other a higher one.

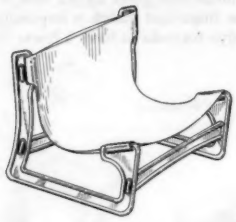
DESIGNS

JANUARY 23, 1973

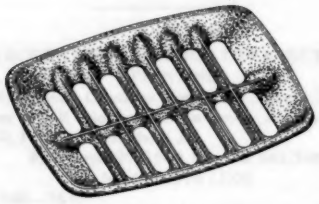
226,051
FISHING ROD RACK
Stuart Y. Fujinami, 2842 S. Norton Ave., Los Angeles, Calif. 90018
Filed Jan. 7, 1971, Ser. No. 104,835
Term of patent 14 years
Int. Cl. D6—*04, 06*
U.S. Cl. D6—114



226,052
SLING CHAIR
Lester Beall, Jr., 219 Hillcrest Drive, High Point, N.C. 27262
Filed Jan. 27, 1971, Ser. No. 110,362
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—66

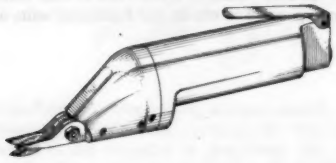


226,053
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,375
Term of patent 14 years
The portion of the term of the patent subsequent to Dec. 19, 1986, has been disclaimed
Int. Cl. D9—*03*
U.S. Cl. D9—219

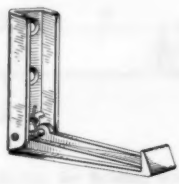


226,054
LOCKING RING FOR A CONTAINER CLOSURE
Frank Nixdorff, Jr., Baltimore, Md., assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Feb. 23, 1971, Ser. No. 118,212
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—266

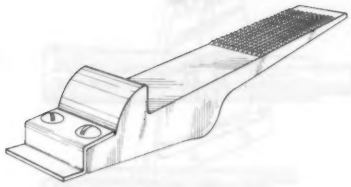
226,055
CUTTING TOOL
Kunio A. Sumida, Los Angeles, Calif., assignor to Leonard U. Shapiro, St. Paul, Minn.
Filed Feb. 25, 1971, Ser. No. 119,070
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—61



226,056
COAT HOOK
Richard L. Watt, Falconer, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.
Filed Mar. 5, 1971, Ser. No. 121,630
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259



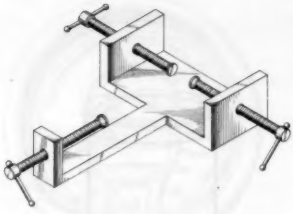
226,057
WALLBOARD LIFTER TOOL
Robert E. Grindinger, Overland Park, Kans.
Filed Mar. 8, 1971, Ser. No. 122,259
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—88



226,058
FOLDING CHAIR
David Woods, Quakertown, Pa., assignor to J. G. Furniture Company, Inc., New York, N.Y.
Filed Mar. 24, 1971, Ser. No. 127,865
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—41

226,059
KNIFE SHARPENER
Eise Willem Clason, Eindhoven, Netherlands, assignor to U.S. Philips Corporation
Filed Mar. 25, 1971, Ser. No. 128,204
Claims priority, application Netherlands Sept. 24, 1971
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D8—63

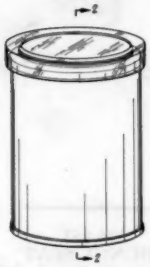
226,060
STILE CLAMP
William C. Wildman, 3915 Hoover St., Boise, Idaho 83705
Filed Apr. 5, 1971, Ser. No. 131,583
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—72



226,061
LOUNGE SEAT
Irving Harmon Kellman, Springvale, Maine, assignor to Spaulding Fibre Company, Inc., Dover, N.H.
Filed Apr. 6, 1971, Ser. No. 131,849
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—37

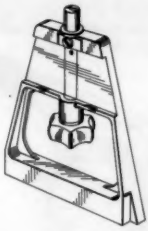
226,062
BACKREST SUPPORT
Charles E. Corchran, Lake Hubert, Minn., assignor to Variety Products Inc., Waseca, Minn.
Filed Apr. 12, 1971, Ser. No. 133,483
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—197

226,063
COMBINED PREMIUM CATALOG AND PACKAGING CONTAINER
Archie E. Warnberg, Oklahoma City, Okla., assignor to Novel Ideas, Inc., Oklahoma City, Okla.
Filed Apr. 15, 1971, Ser. No. 134,539
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193



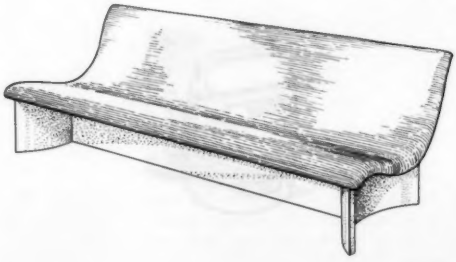
226,064
PICTURE FRAME
Marvin J. Powers, 9 Banbury Court, Bramalea, Ontario, Canada
Filed Apr. 14, 1971, Ser. No. 134,115
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—242

226,065
ALIGNER BASE
John H. Holder, Long Beach, Calif., assignor to Gladys M. Bryant, Lakewood, Calif.
Filed Apr. 15, 1971, Ser. No. 134,538
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



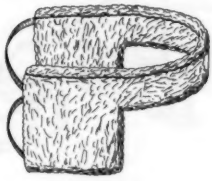
226,066
COMBINED SEAT AND TABLE
Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed Apr. 20, 1971, Ser. No. 135,821
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—42

226,067
SOFA
Gordon L. Duern and Donald S. Griffin, Kitchener, Ontario, Canada, assignors to Electrohome Limited, Kitchener, Ontario, Canada
Filed Apr. 23, 1971, Ser. No. 137,114
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—61



226,068
PENCIL GRIP THERMAL TOOL HANDLE
William Jordan Siegel, 9337 Fraser St., Silver Spring, Md. 20910, and Linus E. Wallgren, 407 Twinbrook Parkway, Rockville, Md. 20851
Filed May 5, 1971, Ser. No. 140,653
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

226,069
EARMUFFS
Alan Edward Little, 5040 A St. SE., Washington, D.C. 20019
Filed May 6, 1971, Ser. No. 141,072
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—259



226,070
COMBINED MAGNIFYING GLASS AND BOTTLE STOPPER
St. Barth Alaska, 3811 S. Scoville Ave., Berwyn, Ill. 60402
Filed May 21, 1971, Ser. No. 145,985
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—261

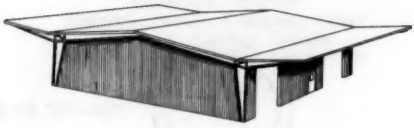
226,071
END CLOSURE FOR A CONTAINER
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation
Filed June 29, 1971, Ser. No. 158,141
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—255

226,072
TAB OPENER FOR A CONTAINER
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation
Filed June 29, 1971, Ser. No. 158,142
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—256

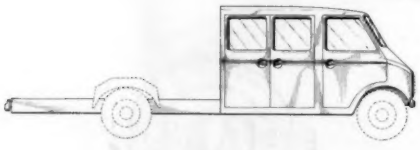
226,073
END CLOSURE FOR A CONTAINER
Teddy M. Westphal, Chesterfield, Mo., assignor to Boise Cascade Corporation, Boise, Idaho
Filed Jan. 18, 1972, Ser. No. 218,854
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—255

226,074
MOBILE HOSPITAL AND MOTEL HOUSEKEEPING LEARNING EXPERIENCE LABORATORY
James T. Glisson, Evinston, Fla., assignor to Motivation Systems, Inc., Gainesville, Fla.
Filed July 23, 1970, Ser. No. 24,094
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R

226,075
BUILDING
William I. Moon and Thomas L. Campbell, Walcott, Iowa, assignors to Truckomatic Corporation, Walcott, Iowa
Filed Mar. 11, 1971, Ser. No. 26,105
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B

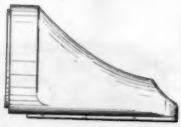


226,076
VEHICLE BODY
Hue R. Lee, 1353 W. Nancy Creek Drive NE., Atlanta, Ga. 30319
Filed Feb. 18, 1971, Ser. No. 116,746
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



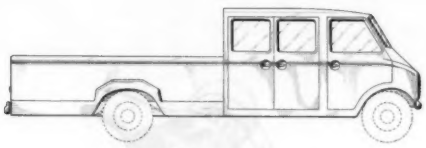
226,077
TRAILER HOOK-UP MIRROR
Robert J. Strohmeier, Castle Rock, Colo., assignor to R. J. Strohmeier Co., Castle Rock, Colo.
Filed Mar. 23, 1971, Ser. No. 127,439
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6

226,078
OUTSIDE REAR VIEW MIRROR FOR VEHICLES
Faustino Trambusti, Corso Orbassano 402/21, Torino, Italy
Filed Mar. 30, 1971, Ser. No. 129,655
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D14—6 M

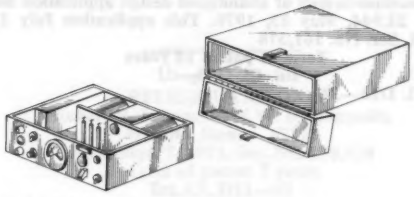


226,079
GOLF CART
Paul E. Gifford, 866 Iredell St., Akron, Ohio 44310
Filed Apr. 21, 1971, Ser. No. 136,296
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3

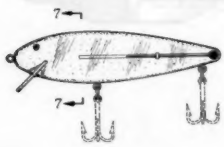
226,080
VEHICLE BODY
Hue R. Lee, 1353 W. Nancy Creek Drive NE., Atlanta, Ga. 30319
Filed May 17, 1971, Ser. No. 144,361
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3 J



226,081
BLASTING CONTROL
Richard N. Snyder, 6505 Lignum St., Springfield, Va. 22150
Filed Jan. 13, 1971, Ser. No. 106,303
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 C



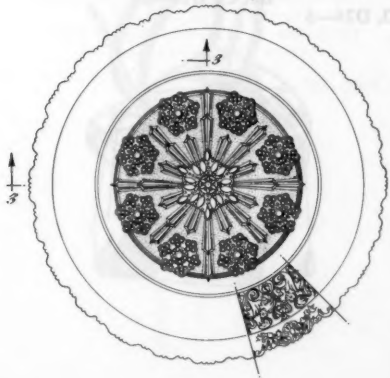
226,082
FISHING LURE
Robert D. Foster, 991 Sharp Ave. NW., Camden, Ark. 71701
Filed Aug. 13, 1971, Ser. No. 171,787
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



226,083
FISH LURE
Foster W. Drake, Gretna, La. (202 Vine St., Maplewood, La. 70663)
Filed Aug. 13, 1971, Ser. No. 171,799
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—29

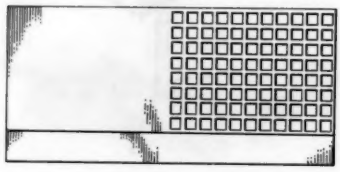
226,084
COMBINED TELEVISION CONTROLLER AND SOUND RECORDING APPARATUS
Masaharu Katayama, Fumiharu Ohta, and Susumu Ezawa, Saijo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 17, 1971, Ser. No. 125,449
Claims priority, application Japan Sept. 18, 1970
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

226,085
WALL PLAQUE
John A. Boroszewski, 155 E. Grand Blvd., Cheektowaga, N.Y. 14225
Filed Apr. 9, 1971, Ser. No. 132,936
Term of patent 14 years
Int. Cl. D11—*03*
U.S. Cl. D29—23

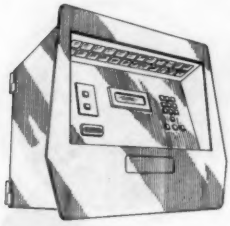


226,086
MEDAL
John E. Hand, 150 NE. 38th St., Oakland Park, Fla. 33308
Filed Apr. 15, 1971, Ser. No. 134,542
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23

226,087
TRUCK BODY MOUNTED REFRIGERATION UNIT
William A. Forsty, Murrysville, Pa., and Joe R. Barnett, Minneapolis, Minn., assignors to Thermo King Corporation, Minneapolis, Minn.
Filed Apr. 19, 1971, Ser. No. 135,518
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—142



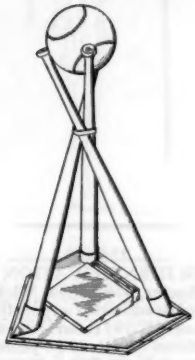
226,088
BANKING MACHINE TERMINAL
George A. Anderson and Edward H. McCauley, Dallas, Tex., assignors to Docutel Corporation
Filed Apr. 23, 1971, Ser. No. 137,118
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



226,089
FISHING REEL CRADLE
Walton H. Whitaker, 8285 Carburton St., Long Beach, Calif. 90808, and Walter J. Schmidt, Jr., 10748 Des Moines Ave., Northridge, Calif. 91324
Filed May 24, 1971, Ser. No. 146,585
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

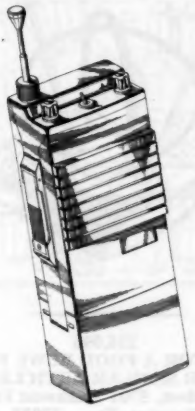
226,090
COMBINED WATER CONTROL HANDLE AND ESCUTCHEON FOR A BATHTUB OR THE LIKE
Ralph La Rue Du Bois, 4242 E. 111th St., Tulsa, Okla. 74135
Continuation-in-part of abandoned design application Ser. No. 22,944, May 13, 1970. This application July 12, 1971, Ser. No. 161,378
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—31

226,091
TROPHY
Robert M. Brack, 1328 W. 8th St., San Pedro, Calif. 90732
Filed July 21, 1971, Ser. No. 164,966
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D29—28



226,092
RELIGIOUS MEDAL
Robert R. Salmans, 208 W. Indianapolis, Wichita, Kans. 67213
Filed Sept. 7, 1971, Ser. No. 178,538
Term of patent 7 years
Int. Cl. D11—*03*
U.S. Cl. D29—11 C

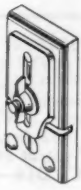
226,093
PORTABLE TRANSMITTER-RECEIVER
John V. Whiting, Carrier 5, Andrews Drive, Altamonte Springs, Fla. 32701, and Gene T. Brown, 1746 Oakmont Lane, Orlando, Fla. 32804
Filed Nov. 19, 1971, Ser. No. 200,661
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



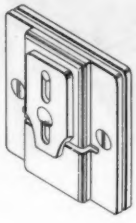
226,094
INDOOR TELEVISION ANTENNA WITH CENTRAL REVOLVING TURRET
Marvin P. Middlemark, 96 Store Hill Road, Old Westbury, N.Y. 11568
Filed Feb. 16, 1972, Ser. No. 227,017
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

226,095
INDOOR TELEVISION ANTENNA WITH CENTRAL REVOLVING TURRET
Marvin P. Middlemark, 96 Store Hill Road, Old Westbury, N.Y. 11568
Filed Feb. 17, 1972, Ser. No. 227,342
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

226,096
HOLDER FOR A FOOD BOWL FOR PETS OR SIMILAR ARTICLE
Tony Robert, 5701 Southwest Freeway Houston, Tex. 77027
Filed Mar. 8, 1971, Ser. No. 122,279
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

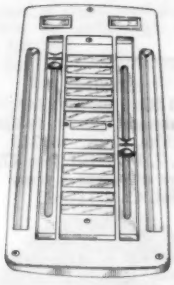


226,097
HOLDER FOR A FOOD BOWL FOR PETS OR SIMILAR ARTICLE
Tony Robert, 5701 Southwest Freeway, Houston, Tex. 77027
Filed Mar. 8, 1971, Ser. No. 122,280
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

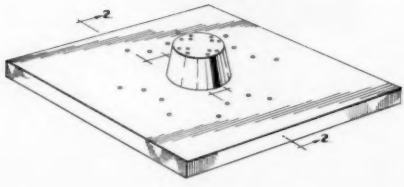


226,098
BIRD FEEDER
Maxwell Berry, 2887 Howell Mill Road NW., Atlanta, Ga. 30327
Filed Dec. 23, 1970, Ser. No. 26,633
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14

226,099
BOWLER IDENTIFICATION PANEL
George E. Schaefer, Muskegon, Mich., assignor to The Brunswick Corporation
Filed Jan. 11, 1971, Ser. No. 105,785
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



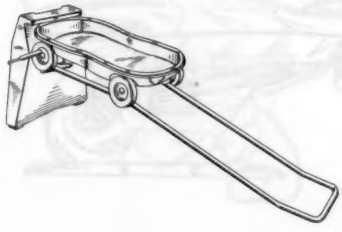
226,100
GAMEBOARD
Richard D. Smith, 913 N. Liberty St., Arlington, Va. 22205
Filed Feb. 10, 1971, Ser. No. 114,405
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



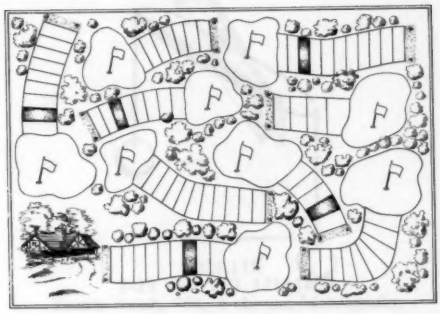
226,101
DOLL
Dora Marcus, 345 8th Ave., New York, N.Y. 10001
Filed July 28, 1971, Ser. No. 167,074
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

226,102
COMBINED GAME BOARD AND SET OF CHESSMEN
Mikhail Ivanovich Klevtsov, Kotelnicheskaya naberezhnaya 1/15, korpus B, kv. 83, Moscow, U.S.S.R.
Filed Mar. 22, 1971, Ser. No. 127,086
Claims priority, application U.S.S.R. Sept. 22, 1970
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

226,103
COMBINED ROLLER COASTER AND VEHICLE THEREFOR
James Smith and Laurie J. Campbell, Erie, Pa., assignors to Louis Marx & Co., Inc.
Filed Apr. 12, 1971, Ser. No. 133,099
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5



226,104
GOLF GAME BOARD
James D. Habuda, 139 Clifton Drive, Youngstown, Ohio 44512
Filed May 17, 1971, Ser. No. 144,363
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—5

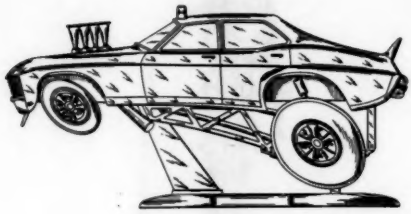


226,105
CABINET FOR A COIN-CONTROLLED AMUSEMENT MACHINE
Joseph E. Lally, McHenry, and Terrence A. Reedy, Jr., Skokie, Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.
Filed July 14, 1971, Ser. No. 162,736
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

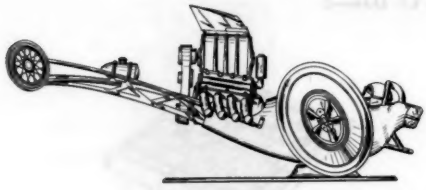
226,106
TETHER BALL TOY
George L. Urquhart, 1267 Creston Place, North Kamloops, British Columbia, Canada
Filed June 8, 1971, Ser. No. 151,163
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

226,107
GOLF CLUB PUTTER
Frank John Indovina, 5266 Oak Park Ave., Encino, Calif. 91316
Filed June 14, 1971, Ser. No. 153,160
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

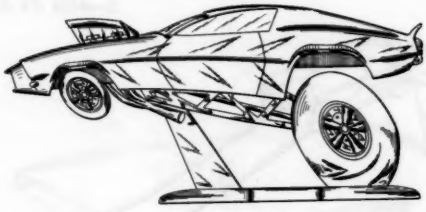
226,108
STYLIZED MODEL CAR
Eugene T. Daniel, Walnut, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed June 21, 1971, Ser. No. 155,185
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



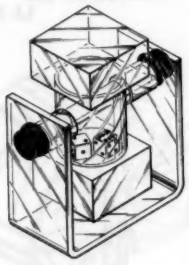
226,109
STYLIZED MODEL DRAGSTER
Eugene T. Daniel, Walnut, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed June 21, 1971, Ser. No. 155,406
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



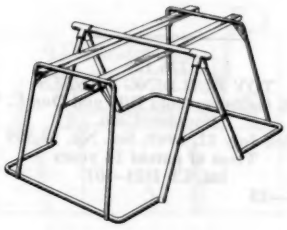
226,110
STYLIZED MODEL CAR
Eugene T. Daniel, Walnut, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed June 21, 1971, Ser. No. 155,407
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



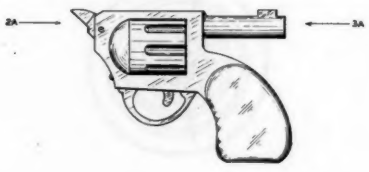
226,111
DICE AGITATOR
Milton Kahn, 142 Greene St., New York, N.Y. 10012
Filed June 21, 1971, Ser. No. 155,412
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



226,112
SUPPORT FRAME ASSEMBLY FOR TRAVELLING SWINGS OR SIMILAR ARTICLES
William R. Tomalinas, Jr., Wilkes-Barre, Pa., assignor to Roth American, Inc., Wilkes-Barre, Pa.
Filed Sept. 30, 1971, Ser. No. 185,483
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 M

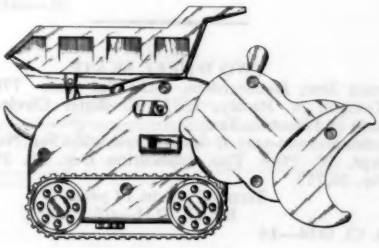


226,113
PISTOL TOY
Roy Dee Griffin, Sr., 4025 Terrace St., Amarillo, Tex. 79109
Filed Oct. 12, 1970, Ser. No. 25,446
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

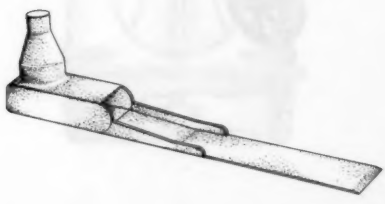


226,114
TOY CONSTRUCTION PIECE
William Barr Nutting, Rockaway Park, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
Filed Feb. 8, 1971, Ser. No. 113,793
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 GG

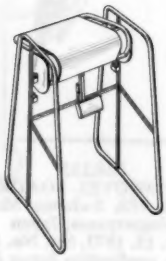
226,115
TOY SHOVEL LOADER
Yasuta Satoh, 758, 5-chome, Matsugaoka, Nagareyama, Japan
Filed Mar. 15, 1971, Ser. No. 124,630
Claims priority, application Japan Jan. 30, 1971
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



226,116
GOLF PUTTING DEVICE
David B. Schuler, 1905 Monterey St., Hermosa Beach, Calif. 90254
Filed Apr. 26, 1971, Ser. No. 137,751
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



226,117
EXERCISER
Frans Engelbertus Krause, 75 Steyn St., Hennenman, Republic of South Africa
Filed Apr. 30, 1971, Ser. No. 139,299
Claims priority, application Republic of South Africa Dec. 22, 1970
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

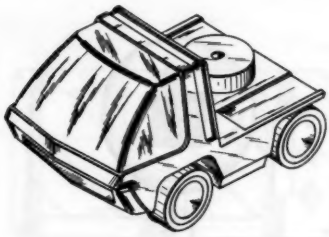


226,118
TWO WHEEL SKATE
Norma Jean Deberardino, 1823 Sul Ross 77006, and Kenneth A. Roddy, 15322 E. Ritter Circle 77073, both of Houston, Tex.
Continuation-in-part of design application Ser. No. 19,080, Sept. 10, 1969. This application Dec. 30, 1970, Ser. No. 26,713
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14

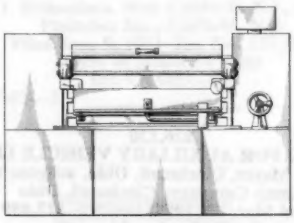
226,119
SCOOP AND DISPENSER DEVICE FOR GAME CHIPS
Judith E. Andamasaris, 718 N. Drive, New Buffalo, Mich. 49117
Filed Apr. 19, 1971, Ser. No. 135,522
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—13

226,120
TOY BUILDING PANELS
Charles S. Ogsbury, Gold Hill, and Don C. Witte, Boulder, Colo.
Filed July 22, 1969, Ser. No. 18,309
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

226,121
TOY TRUCK
Ira B. Gilford, Thousand Oaks, and Alan W. B. Nash, Torrance, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Original design application Mar. 2, 1970, Ser. No. 21,671. Divided and this application Sept. 1, 1971, Ser. No. 177,214
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

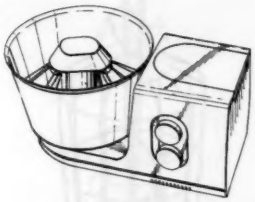


226,122
FLATWARE SURFACE FINISHING MACHINE
James W. Weatherell, Arthur Baron, and Francis R. Chesner, Olean, N.Y., assignors to Clair Mfg. Co. Inc., Olean, N.Y.
Filed Apr. 15, 1971, Ser. No. 134,551
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D37—1 A

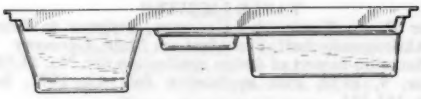


226,123
COMBINED DIAL AND HANDS FOR A TIMEPIECE
Robert C. Burroughs, 11208 Evans Trail, Apt. 102, Beltsville, Md. 20705
Filed May 4, 1971, Ser. No. 140,308
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1

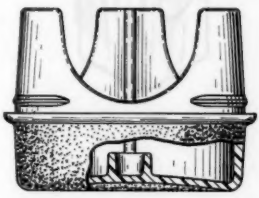
226,124
ELECTRIC MIXER
Kenfyn Arfor Roberts, High Wycombe, England, assignor to British Domestic Appliances Limited, Peterborough, England
Filed Sept. 23, 1971, Ser. No. 183,292
Claims priority, application Great Britain Mar. 25, 1971
Term of patent 7 years
Int. Cl. D7—*04*
U.S. Cl. D44—1



226,125
UTILITY TRAY
Fuller Robinson, Laval, Quebec, Canada, assignor to Standard Desk Company, Laval, Quebec, Canada
Filed Oct. 29, 1970, Ser. No. 25,713
Claims priority, application Canada Oct. 15, 1970
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D44—10



226,126
BASE FOR HOLDING BOTTLES OR THE LIKE
Robert M. Washburn, Mahtomedi, and Oliver K. Washburn, White Bear Lake, Minn., assignors to W. O. Washburn & Sons, Inc., St. Paul, Minn.
Filed Feb. 1, 1971, Ser. No. 111,801
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D44—10

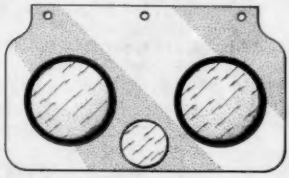


226,127
TABLE ORNAMENT
Chosuke Miyahira, 373 Park Ave. S., New York, N.Y. 10016
Filed Mar. 25, 1971, Ser. No. 128,217
Term of patent 14 years
Int. Cl. D7—*99;* D30—*02;* D17—*99*
U.S. Cl. D44—24 B

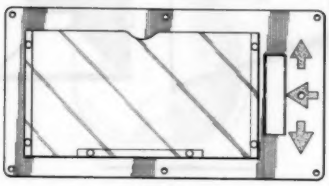
226,128
TABLE LIGHTER
Dieter Rams, Konigstein, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Continuation-in-part of design application Ser. No. 21,801, Mar. 9, 1970. This application July 12, 1971, Ser. No. 161,401
Claims priority, application Germany Sept. 9, 1969
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

226,129
OUTDOOR LIGHTING FIXTURE
Anthony C. Donato, Westfield, N.J., assignor to Lightolier Incorporated, Jersey City, N.J.
Filed June 30, 1971, Ser. No. 130,050
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

226,130
HOUSING FOR AUXILIARY VEHICLE LIGHTS
August B. Meyer, Cincinnati, Ohio, assignor to K-D Lamp Company, Cincinnati, Ohio
Filed Mar. 22, 1971, Ser. No. 127,089
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R

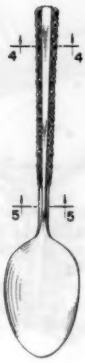


226,131
LAUNDRY MACHINE PROGRAMMER FACE PANEL
Benjamin H. Freze, Anaheim, Calif., assignor to Challenge-Cook Bros., Incorporated, Industry, Calif.
Filed Apr. 2, 1971, Ser. No. 130,873
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—1

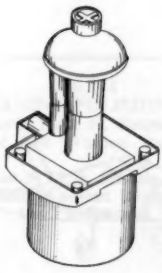


226,132
FRAME FRONT FOR MERCHANDISING MACHINE
Gerald J. Bellasalma, West Caldwell, N.J., assignor to Plastetics Inc., Fairfield, N.J.
Filed June 9, 1971, Ser. No. 151,289
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

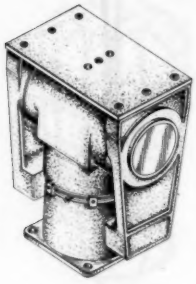
226,133
DESIGN FOR A SPOON OR SIMILAR ARTICLE OF FLATWARE
William J. Knope, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Nov. 19, 1971, Ser. No. 200,643
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12



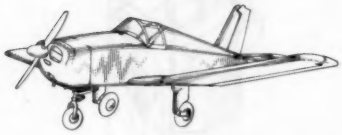
226,134
WATER CIRCULATING PUMP
Eugene G. Danner, 9122 71st Road, Forest Hills, N.Y. 11375
Filed Nov. 3, 1970, Ser. No. 25,801
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1 R



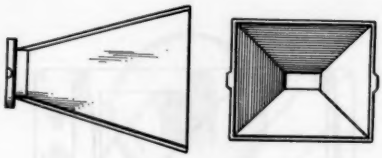
226,135
CAMERA MOUNT
Donald N. Horn, Huntington, and Rein S. Randmae, North Babylon, N.Y., assignors to Vicon Industries, Inc., Farmington, N.Y.
Filed Sept. 20, 1971, Ser. No. 182,291
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 G



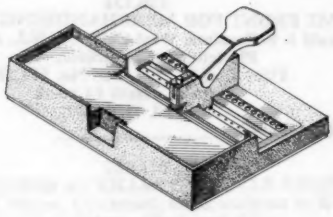
226,136
AIRPLANE
John W. Bock, 3152 Charlemaine Ave., Long Beach, Calif. 90808
Filed Feb. 24, 1971, Ser. No. 118,592
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1 E



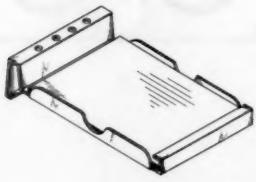
226,137
ELECTRONIC HORN RADIATOR
Kenneth Spencer Selsby, 4 Jesmond Ave., Vaucluse, New South Wales, Australia
Filed Mar. 25, 1971, Ser. No. 128,223
Claims priority, application Australia Oct. 27, 1970
Term of patent 3½ years
Int. Cl. D29—*99*
U.S. Cl. D72—1 C



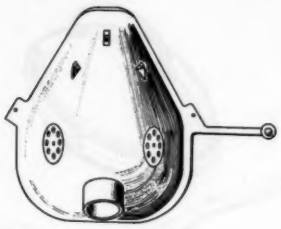
226,138
BALLOT PUNCH
Kellog D. Fleming, San Francisco, Calif., assignor to Diamond National Corporation, San Francisco, Calif.
Filed Apr. 14, 1971, Ser. No. 134,118
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1



226,139
HOLDER FOR PAPER AND WRITING INSTRUMENTS OR THE LIKE
Moritoshi Kimura, 34–7, 2-chome, Higashi Mukojima, Tokyo, Japan
Filed July 26, 1971, Ser. No. 166,327
Claims priority, application Japan Feb. 27, 1971
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—9

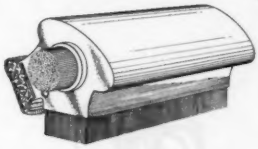


226,140
FACE MASK
William R. King, Denver, Colo., assignor to Sandoz-Wander, Inc., Hanover, N.J.
Continuation-in-part of design application Ser. No. 144,384, May 17, 1971. This application Nov. 19, 1971, Ser. No. 200,640
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1

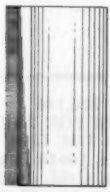


226,141
DOUBLE-SIDED BRUSH
Kurt Krusche, Frankfurt am Main, and Hubert Zimmermann, Mannheim, Germany, assignors to Allstar Verbruchsguter G.m.b.H. & Co. K.G., Frankfurt, Germany
Filed Oct. 5, 1970, Ser. No. 25,330
Claims priority, application Germany June 15, 1970
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D86—13

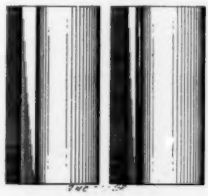
226,142
SHOE CLEANING-POLISHING DEVICE
Andrew W. Brainerd, Kent H. Brainerd, and Stuart W. Brainerd, all of 630 Walden Road, Winnetka, Ill. 60093
Filed Mar. 5, 1971, Ser. No. 121,616
Term of patent 14 years
Int. Cl. D4—*99*
U.S. Cl. D86—11



226,143
SHOE CLEANING-POLISHING DEVICE
Andrew W. Brainerd, Kent H. Brainerd, and Stuart W. Brainerd, all of 630 Walden Road, Winnetka, Ill. 60093
Filed Mar. 5, 1971, Ser. No. 121,618
Term of patent 14 years
Int. Cl. D4—*99*
U.S. Cl. D86—11

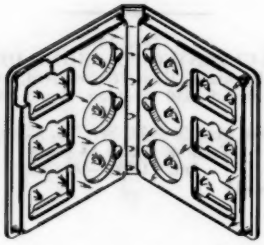


226,144
SHOE CLEANING-POLISHING DEVICE
Andrew W. Brainerd, Kent H. Brainerd, and Stuart W. Brainerd, all of 630 Walden Road, Winnetka, Ill. 60093
Filed Mar. 5, 1971, Ser. No. 121,619
Term of patent 14 years
Int. Cl. D4—*99*
U.S. Cl. D86—11



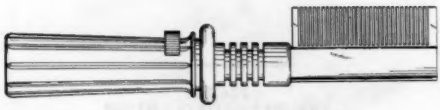
226,145
FLUID DELIVERY APPARATUS
Stephens N. Sato, San Diego, Calif., assignor to Ivac Corporation, San Diego, Calif.
Filed Apr. 21, 1971, Ser. No. 136,154
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F

226,146
STORAGE ALBUM FOR TAPE CASSETTES OR THE LIKE
Gerald L. Price, 16610 Calneva Drive, Encino, Calif. 91316
Original design application Apr. 17, 1970, Ser. No. 22,480. Divided and this application Apr. 14, 1971, Ser. No. 133,935
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1

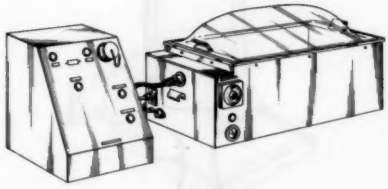


226,147
PURSE
Santiago C. Sosa, 2000½ N. Hudson, San Angelo, Tex. 76901
Filed Nov. 17, 1971, Ser. No. 199,825
Term of patent 3½ years
Int. Cl. D3—*01*
U.S. Cl. D87—3

226,148
PRESSING COMB
Leandro P. Rizzuto and Milton Schrager, Brooklyn, N.Y., assignors to Continental Hair Products, Inc.
Filed Dec. 28, 1971, Ser. No. 213,241
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8



226,149
AUTOMATIC GAS STERILIZER
Leonard L. Melanson, Stow, Mass., assignor to Amdek Corporation
Filed May 6, 1971, Ser. No. 141,074
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



226,150

BICYCLE HANDLEBAR

Carlton P. Pawsat, 47 Bryant Circle, and Robert T. Humlong, 46 Bryant Circle, both of Maysville, Ky. 41056

Continuation-in-part of design application Ser. No. 23,642, June 24, 1970. This application Feb. 2, 1971, Ser. No. 112,098

Term of patent 14 years

Int. Cl. D12—*06*

U.S. Cl. D90—11

226,151

BICYCLE HANDLEBAR

Carlton P. Pawsat and Robert F. Humlong, Maysville, Ky., assignors to Wald Manufacturing Company, Inc.

Continuation-in-part of design application Ser. No. 23,643, June 24, 1970. This application Feb. 2, 1971, Ser. No. 112,099

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D90—11

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23D DAY OF JANUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abel, Carroll; Clifton, John R.; and Lueking, James R., to United States of America, Navy. Variable delay fuze for aircraft parachute flare. 3,712,232, Cl. 102-85.200.

ACF Industries, Incorporated: *See—*
Atkinson, Eulas R., 3,712,479.
Geyer, Wallace T.; and Randolph, Robert W., 3,712,250.

Acieries Reunies de Burbach-Eich-Dudelange S.A., ARBED: *See—*
Liesch, Jean; and Removille, Jacques, 3,711,993.

Adachi, Iwao P., to Itek Corporation. Triple-layer anti-reflection coating design. 3,712,711, Cl. 350-164.000.

Adams, Jack S.: *See—*
Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., 3,711,929.

Adie, James S., to Eldon Industries, Inc. Single spring switch with wiping action. 3,712,970, Cl. 200-164.00r.

Admiraal, Lambertus, to MacMillan Bloedel Limited. Waveguide apparatus for microwave drying of materials. 3,712,971, Cl. 219-10.550.

Admiral Corporation: *See—*
Stute, Carlton F., 3,712,958.

Adolphi, George F. Apparatus and process for preparing cooked egg products. 3,712,208, Cl. 99-373.000.

Advance Patent Technology, Inc.: *See—*
Guberman, Jerald; and Holt, Herman D., 3,711,896.

Advanced Patent Technology, Inc.: *See—*
Guberman, Jerald; and Snaper, Alvin A., 3,712,085.

AEG-Elotherm GmbH: *See—*
Kohler, Henning, 3,713,020.

Aelterman, Marcel Frans, to Agfa-Gevaert N.V. Device for controlling the regenerating of photographic processing solution. 3,712,204, Cl. 95-89.00r.

Agfa-Gevaert A.G.: *See—*
Theer, Anton, 3,712,560.

Agfa-Gevaert Aktiengesellschaft: *See—*
Kisselmann, Willy; Rumpelein, Fritz; and Kopf, Paul, 3,712,262.
Lederer, Josef, 3,712,732.
Neudecker, Karl, 3,712,722.
Nittel, Fritz; Ohlschlager, Hans; and Schranz, Karl-Wilhelm, 3,712,818.
Ranz, Erwin; Von Rintelen, Harald; Schutz, Heinz-Dieter; and Neumann, Wolfram, 3,712,814.
Stenzenberger, Volkmar; Fuchsle, Klaus; and Hennig, Fridolin, 3,712,557.
Wagner, Karl, 3,712,197.
Winkler, Alfred; Winkler, Friedrich; Neudecker, Karl; and Zanner, Johann, Jr., 3,712,720.
Zanner, Johann, Jr., 3,712,719.

Agfa-Gevaert N.V.: *See—*
Aelterman, Marcel Frans, 3,712,204.
Van Paesschen, August Jean; Brinckman, Eric Maria; and De Geest, Wilfried Florent, 3,712,812.

Aghnides, Elie P. Water aerator. 3,712,548, Cl. 239-428.500.

Aiki, Shigeo; Kito, Masahior; and Ueda, Atumi, to Aisin Seiki Kabushiki Kaisha. Control valve. 3,712,057, Cl. 60-54.50p.

Air Preheater Company, Inc., The: *See—*
Waitkus, Joseph; and Van Buskirk, Derek Orem, 3,712,597.

Airtex Product Div., United Industrial Syndicate: *See—*
Parrent, Russell, 3,711,907.

Aisin Seiki Company Limited: *See—*
Torii, Tatsumi; and Miyajima, Haruo, 3,712,425.

Aisin Seiki Kabushiki Kaisha: *See—*
Aiki, Shigeo; Kito, Masahior; and Ueda, Atumi, 3,712,057.
Kobayashi, Toyoaki; Kondo, Toshio; and Sakakibara, Naoji, 3,713,091.

Aki, Yoshiaki: *See—*
Hosokawa, Masuo; Yokoyama, Tohei; Suzuki, Teruaki; Aki, Yoshiaki; and Tokui, Masahiko, 3,712,551.

Albright, Donald E., to Minnesota Mining and Manufacturing Company. Electrical circuit for providing and maintaining a binary signal change in response to a predetermined change in a sensed analog condition. 3,712,991, Cl. 307-252.00f.

Alderfer, Sterling W. Pneumatic tire without bead reinforcement rings. 3,712,362, Cl. 152-361.000.

Alexander, George F., to Caterpillar Tractor Company. Dual pitch track links for adjustment of cushioned tracks. 3,712,687, Cl. 305-19.000.

Alinari, Carlo. Depth gauges. 3,712,138, Cl. 73-300.000.

Alleaume, Jean H., to Technigaz. Method and device for supporting a conveyed tank against roll and pitch. 3,712,257, Cl. 114-74.00a.

Allen, Eugene; and Stearns, Edwin Ira, to American Cyanamid Company. Method of color matching with more than three components. 3,713,173, Cl. 441-1.000.

Allen, Joseph B.; and Lippmann, Henry E., to International Business Machines Corporation. Line segment intersection test. 3,712,975, Cl. 444-1.000.

Allen, Joseph J. Spherical souvneir receptacle. 3,711,976, Cl. 40-82.000.

Allis-Chalmers Corporation: *See—*
Comfort, Samuel T., 3,712,492.
Harolow, James H., 3,713,060.
Schmitz, Raymond B., 3,712,309.

Allison, David F.; and Russell, Lewis K., to Signetics Corporation. Method for making MOS structure with precisely controlled channel length. 3,711,940, Cl. 29-571.000.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Isberg, Per Gustaf; Pind, Christen Willemoes; and Sundqvist, Cnut Herbert, 3,712,851.

Allred, Victor D., to Marathon Oil Company. Control of calcined petroleum coke particle size. 3,712,855, Cl. 201-6.000.

Allyn, Harold D. Autoloading firearm. 3,711,983, Cl. 42-75.00c.

Alpers, Frederick C., to United States of America, Navy. Sector gating circuit. 3,712,562, Cl. 244-3.150.

Alpers, Frederick C., to United States of America, Navy. Automatic path follower guidance system. 3,712,563, Cl. 244-3.170.

Alphons Glutz-Blotzheim AG: *See—*
Husler, Balthasar, 3,712,011.

Alroy, John D., to Borden Inc. Egg carton. 3,712,532, Cl. 229-44.00r.

Althaus, Ernst, to Orenstein & Koppel Aktiengesellschaft. Hydraulically operable device for changing the track width of track-laying vehicles. 3,712,398, Cl. 180-9.480.

Aluminum Company of America: *See—*
Lawrence, Kenneth C., 3,712,498.

A.M.A. (Artigiana Meccanici Associati): *See—*
Zucchini, Guido, 3,712,087.

Ambrus, Laszlo, to Cutter Laboratories, Inc. 5[1-(Phenyl or benzyl)-lh-indazol-3-yloxymethyl]-tetrazoles. 3,712,903, Cl. 260-308.00d.

American Can Company: *See—*
Casey, William P., Jr.; and Grundman, Frank G., 3,712,848.

American Cyanamid Company: *See—*
Allen, Eugene; and Stearns, Edwin Ira, 3,713,173.
Castellion, George Augustus; and Spitzer, Donald Paul, 3,712,710.
Kaempfen, Henry Xavier, 3,712,888.
Stamm, Robert Franz, 3,712,706.

American LaFrance Inc.: *See—*
Specht, Glenn E., 3,712,587.

American Science & Engineering Inc.: *See—*
Orfei, John B.; and Shapiro, Henry, 3,711,991.

Ames, Alvin G. Inclined surface reaction-type game board. 3,712,621, Cl. 273-120.00r.

Ames, Russell K., Sr. Boat loader for automobiles. 3,712,524, Cl. 224-42.10h.

Ametek, Inc.: *See—*
Martindale, David L.; Dale, Alan M.; Mursinna, Richard C.; and Rewerts, Gene R., 3,712,583.

AMF Incorporated: *See—*
Giatti, Filippo, 3,712,162.
Sands, Ovie L., 3,712,146.

Amicel, Charles Gustavf: *See—*
Jacquot, Michel Jules; Amicel, Charles Gustavf; and Renaudon, Marie Michel, 3,712,611.

Amidon, Charles H., Jr.: *See—*
Galeone, Vicent A.; and Amidon, Charles H., Jr., 3,711,913.

Amoco Production Company: *See—*
Vincent, Renic P.; and Wilder, Lawrence B., 3,712,387.

Amoroso, Michael J., to Lee-Norse Company. Mining machine having dust collecting means. 3,712,678, Cl. 299-68.000.

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AMP Incorporated: *See—*
Busler, Willard LeRoy; and Ross, Milton Dean, 3,711,922.
Crumley, J. A.; Hildebrand, James Ross; Kerstetter, Harold Alfred; and Shaak, Ray Ned, 3,712,735.
Henschen, Homer Ernst; and Huffnagle, Clifton Wesley, 3,713,072.
Reynolds, Charles Edward, 3,711,942.

AMP Incorporated, mesne: *See—*
Dechelette, Helen, 3,713,079.

Amsted Industries Incorporated: *See—*
Brown, Jesse C., 3,712,601.
Young, Donald Marion, 3,712,247.

Anachenko, Sofia Nikolaevna: *See—*

Serebryakova, Tatyana Andreevna; Zakharychev, Ardalion Vladimirovich; Chigir, Rimma Nuriakhmetova; Anachenko, Sofia Nikolaevna; Torgov, Igor Vladimirovich; and Krjutchenko, Evgenia Georgievna, 3,712,910.

Anaconda Wire and Cable Company: *See—*
Arnaudin, Edwin H., Jr., 3,712,770.

Andersen, Borge Christian. Method and apparatus for filling trays. 3,712,347, Cl. 141-12.000.

Andersen, Harry A. Aerated bait keeper. 3,711,986, Cl. 43-57.000.

Anderson, Norman J.; and Decker, John L., to Zurn Industries, Inc. Synchronizing flexible coupling. 3,712,434, Cl. 192-53.00e.

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Anderson, V. E., Mfg., Co.: *See—*
Anderson, Richard N., 3,711,995.

Anderson, William Paul: *See—*
Kalikow, Irving; Sterling, Eliot Morton; and Anderson, William Paul, 3,712,756.

Ando, Sutematsu, to Century Products, Inc. Inflatable chair. 3,712,674, Cl. 297-456.000.

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Andrysiak, Stanislaw J.; and McKenna, Ronald F., to Bell Aerospace Company. Cooled pintle assembly. 3,712,063, Cl. 60-265.000.

Anetsberger Brothers, Inc.: *See—*
Meyer, Alfred Lake, 3,712,165.

Anfossi, Henri; and Poupin, Raymond, to Service D'Exploitation Industrielle des Tabacs et des Allumettes. Device for conveying rod-shaped objects and especially cigarettes. 3,712,455, Cl. 198-165.000.

Angele, Eugen: *See—*
Striegler, Werner; and Angele, Eugen, 3,712,256.

Angliker, Hans-Joerg; and Peter, Richard, to Ciba-Geigy AG. Azole disazo dyestuffs. 3,712,881, Cl. 260-158.000.

Anthony, Russell W.: *See—*
Motz, Carl H.; and Anthony, Russell W., 3,712,094.

Anvar-Agence Nationale De Valorisation de La Recherche: *See—*
Cohen, Rene A., 3,712,742.

Aoki, Katashi. Device for ejecting in injection molding of threaded articles. 3,712,786, Cl. 425-438.000.

Apollo Plastic & Machines Co., Inc.: *See—*
Luginbuhl, David E., 3,712,779.

Appeldorn, Roger H., to Minnesota Mining and Manufacturing Company. Optical shield of transparent intermeshed grooved panels useful on overhead projectors. 3,712,713, Cl. 350-276.00r.

Applied Power Industries, Inc.: *See—*
Hunnicutt, Wayne E., 3,712,108.

Archer, Harold B.: *See—*
Florsheim, Leonard S., Jr.; Archer, Harold B.; Lo Presti, Philip F.; and Sutherland, Thurlow J., 3,712,730.

Arendale, Donald L. Automatic carcass processing device. 3,711,895, Cl. 17-1.00r.

Arenson, Edwin M., to Black, Sivalls & Bryson, Inc. Method and apparatus for vaporizing and superheating cryogenic fluid liquids. 3,712,073, Cl. 62-52.000.

Aresi, Vanna: *See—*
Nathansohn, Giangiacomo; Aresi, Vanna; and Winters, Giorgio, 3,712,897.

Armer, Herbert Leslie, to Mastertape (Magnetic) Limited. Impact detector. 3,713,130, Cl. 340-267.00r.

Armstrong, William M., Jr.; Edwards, Webster H.; and Vining, Roy H., to Du Pont de Nemours, E. I., and Company. Spectrophotometer multi-angle viewing device. 3,712,745, Cl. 356-244.000.

Arnaudin, Edwin H., Jr., to Anaconda Wire and Cable Company. Apparatus for extruding cable jackets with embedded drain wires. 3,712,770, Cl. 425-114.000.

Arnerich, Paul J.: *See—*
Thometz, Theodore G.; and Arnerich, Paul J., 3,712,854.

Arrighetti, Sergio; Roggero, Arnaldo; Vajna, Eugenio; and Cesca, Sebastiano, to Snam Progetti S.p.A. Curable amorphous olefinic terpolymers obtained from alpha-olefins and polyene hydrocarbon containing two conjugated double bonds and process for preparin same. 3,712,876, Cl. 260-80.700.

Arrowhead Engineering Corporation: *See—*
Shaffer, Samuel Ralph; and Scott, Earl D., 3,712,098.

Arsco Paint Rollers, Inc.: *See—*
Chapman, Paul G., 3,711,887.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Nobusawa, Tsukumo, 3,712,190.
Nobusawa, Tsukumo, 3,712,191.

Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, to Du Pont de Nemours, E. I., and Company. Apparatus and method for gradient elution. 3,712,513, Cl. 222-134.000.

Asnes, Floyd. Button feeding machine. 3,712,253, Cl. 112-113.000.

Assmus, Friedrich: *See—*
Wolber, Robert; and Assmus, Friedrich, 3,712,044.

Associated Engineering Limited: *See—*
Bemrose, Colin R.; Brown, Dennis C.; and Turner, William G., 3,712,101.

Ataniya, Takeshi: *See—*
Kimuro, Tadao; and Ataniya, Takeshi, 3,712,826.

Athey, Roy L.; and Moore, Joseph B., to United Aircraft Corporation. Method for forming composite articles from alloy in temporary condition of superplasticity. 3,711,936, Cl. 29-475.000.

Atkins, Walter J.: *See—*
Lamka, Charles E.; and Atkins, Walter J., 3,712,019.

Atkinson, Eulas R., to ACF Industries, Incorporated. Rubber-hydraulic draft gear for railway cars. 3,712,479, Cl. 213-47.000.

Atkinson, Thomas William Lancaster: *See—*
Hamshere, Wilfred Charles; and Atkinson, Thomas William Lancaster, 3,712,795.

Atlantic Richfield Company: *See—*
Hamersma, J. Warren; and Caserio, Frederick F., Jr., 3,712,931.
Janssen, Albert T., 3,712,677.
Sheldahl, David B.; and Striegler, John H., 3,712,393.

Aubry, Yvon C.; and Vallance, Jacques, said Aubry assor. to Valcartier Industries, Inc. Inspection and transfer mechanism. 3,712,466, Cl. 209-73.000.

Audi NSU Auto Union Aktiengesellschaft: *See—*
Beutter, Karl, 3,712,767.

August, Henry, to North American Rockwell Corporation. Energy absorption by a radioisotope produced plasma. 3,713,157, Cl. 343-18.000.

Automation Industries, Inc.: *See—*
Cross, Benjamin T.; and Posakony, Gerald J., 3,712,119.

Avco Corporation: *See—*
Kantrowitz, Arthur R.; Gerry, Edward T.; Leonard, Donald A.; and Wilson, Jack, 3,713,030.
McNair, Robert J., 3,713,025.
Obligado, Alvaro, 3,712,032.

Averill, Donald H. Invalid lift aid. 3,711,877, Cl. 5-81.000.

Avery, William H.: *See—*
Burson, Richard D.; and Avery, William H., 3,712,448.

Avis, John M., to Harvey Harvester, Inc. Crop pick-up harvester. 3,712,039, Cl. 56-328.00r.

Avivi, Pinchas; and Dothan, Felix, to Yissum Research Development Company of the Hebrew University. Gas lasers with electrically-conductive plasma tube. 3,713,043, Cl. 331-94.500.

AVL AG: *See—*
Harnoncourt, Karl, 3,712,325.

AVM Corporation: *See—*
Nelson, Robert W., 3,712,744.

Aztec Manufacturing Company: *See—*
Eschbach, Robert C.; and Colligan, John B., 3,712,005.

Babler, Egon S., to Teletype Corporation. Friction clutch. 3,712,432, Cl. 192-26.000.

Bach, Lloyd G.; and Ewald, Jerome T., to Bendix Corporation, The. Hydraulic brake booster with disc reaction. 3,712,177, Cl. 91-369.00a.

Bachmann, Peter, to Ebauches Bettlach S.A. Timepiece movement comprising a jumping type indicator. 3,712,048, Cl. 58-58.000.

Bader, Jorg; and Gatzi, Karl, to Ciba-Geigy Corporation. 1,2-Dithiolones having sulphur-containing substituents. 3,712,908, Cl. 260-327.00c.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Petersen, Harro, 3,712,926.
Schoellkopf, Ulrich; and Gerhart, Fritz, 3,712,911.
Weissauer, Hermann, 3,712,901.

Baglai, Vitaly Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; and Baglai, Vitaly Mikhailovich, 3,712,365.

Baguelin, Yves M.: *See—*
Brille, Maurice G.; and Baguelin, Yves M., 3,712,280.

Baird, Roy W.: *See—*
Hyland, William P.; Baird, Roy W.; and Culbertson, James A., 3,712,680.

Baker, Arthur Yeaton, to Datametrics Corporation. High speed impactless data printer. 3,713,168, Cl. 346-74.00e.

Baker, Charles: *See—*
Chapman, James R.; Baker, Charles; and Gentry, Hermond G., 3,712,464.

Baker, Harold L., to Morrison Products, Inc. Method for assembling centrifugal blowers. 3,711,914, Cl. 29-156.8cf.

Baker Oil Tools, Inc.: *See—*
Curington, Alfred R., 3,712,388.

Baker, Richard L., to Colt Industries Operating Corporation, mesne. Revolver having removable cylinder. 3,711,982, Cl. 42-62.000.

Baladjanian, Gregor: *See—*
Commanday, Maurice R.; Clark, Eugene V.; and Baladjanian, Gregor, 3,711,909.

Balda Werke Photographische Gerate und Kunststoff R. Gruter Kommanditgesellschaft: *See—*
Lange, Karl Heinz, 3,712,196.

Balda-Werke: *See—*
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Ball Brothers Research Corporation: *See—*
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Munson, Robert E.; Krutsinger, Jack K.; and Polson, Jerry H., 3,713,166.

Ball Corporation: *See—*
Hurst, Robert L., 3,712,450.
Hurst, Robert L., 3,712,453.

Balme, Maurice; and Gruffaz, Max, to Rhone-Poulenc S.A. Polysulphone compositions. 3,712,932, Cl. 260-857.0pi.

Banus, Bernard R., to Sterling Manufacturing Company. Calibratable ammeter having a pestoring magnet mounted on a bendable tab. 3,713,024, Cl. 324-146.000.
Bargoin, Jean, to Unimeco Anstalt. Lighted match dispenser. 3,712,508, Cl. 221-141.000.
Barker, George R. Asparagus harvester. 3,712,038, Cl. 56-327.00a.
Barleen, David G.: *See*—
Wong, Stephen; Wright, Louis J.; and Barleen, David G., 3,713,128.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Schippers, Heinz; and Hensen, Friedheim, 3,712,594.
Barnes, Claude Earnest. Three-wheel vehicle. 3,712,400, Cl. 180-27.000.
Barnes, Douglas W., to Littlcomputers, Inc. Sequential card sorting apparatus. 3,712,467, Cl. 209-110.500.
Barnes, Ralph. Apparatus for moulding helmet shells and the like. 3,712,787, Cl. 425-438.000.
Baron, Jean. Automatic repertory telephone dialer utilizing magnetic memory storage. 3,712,960, Cl. 179-90.0bb.
Barreca Products Co.; subsidiary of Shelburne Industries, Inc.: *See*—
Penniman, Robert, 3,712,522.
Barsamian, Harut, to National Cash Register Company, The. Firmware sort processor system. 3,713,107, Cl. 340-172.500.
Barthalow, Henry D.: *See*—
Helm, Herbert W.; and Barthalow, Henry D., 3,712,265.
Bartholomaus, Reiner; Diehl, Dieter; and Himmler, Conrad R.; deceased (by Himmler, Irma; heiress), said Diehl and said Bartholomaus assors. to Lohrer, G. L. Rexroth, Eisenwerk GmbH. Regulating apparatus with throttle gaps. 3,712,339, Cl. 137-625.620.
Barton, Robert F., to Gautney & Jones. Peak detector. 3,712,989, Cl. 307-235.000.
Basier, Robert; and Parisot, Clovis, to Societe Anonyme de Recherches et de Commercialisation de Produits de Resines de Synthese R.C.P. and Houilleres du Bassin du Nord et du Pas de Calais. Compartmented tanker and method of constructing the same. 3,712,50, Cl. 220-20.000.
Bassett, W. E., Company, The: *See*—
Hedu, Jon, 3,712,311.
Batt, Harold Hilton, to Renhurst Industries Proprietary Limited. Apparatus and method for laying cross filaments and the like. 3,711,932, Cl. 29-419.000.
Battelle Memorial Institute: *See*—
Fichaux, Henri, 3,712,833.
Bauer, Andrew B., to Philco-Ford Corporation. Low loss vortex fluid amplifier valve. 3,712,321, Cl. 137-81.500.
Bauer, Benjamin B.; and Foster, Edward J., to Columbia Broadcasting System, Inc. Acoustical direction detector. 3,713,087, Cl. 340-16.00r.
Bauer, Ralf; Lorenz, Wilfred; Rohr, Udo; and Silge, Friedrich, to Veb Warmowwerft Warnemunde. Rollback closure for tightly sealing openings especially of ships. 3,712,258, Cl. 114-202.000.
Baughman, James R.: *See*—
United States of America, National Aeronautics and Space Administration, 3,712,132.
Baumbaugh, Charles R.: *See*—
Pelizzoni, Winton J.; Baumbaugh, Charles R.; and Calliss, William A., 3,712,420.
Baumgarten, Wilfried, to Continental Gummi-Werke Aktiengesellschaft. Device for feeding plastic rubber or synthetic rubber mixtures to processing machines. 3,712,773, Cl. 425-142.000.
Baumgras, George R., to North American Rockwell Corporation. Coated spring. 3,711,917, Cl. 29-173.000.
Baxter Laboratories: *See*—
Martinez, Flelix Jesus, 3,712,474.
Baxter Laboratories, Inc.: *See*—
Martinez, Felix Jesus, 3,712,475.
Bayer Aktiengesellschaft: *See*—
Schon, Nikolaus; Schnoring, Hildegard; Witte, Josef; and Pampus, Gottfried, 3,712,867.
Bea, Karl J. Foldable building construction of roof and wall sections. 3,712,006, Cl. 52-71.000.
Beach, David E., to Eastman Kodak Company. Film creep preventing means for cameras. 3,712,200, Cl. 95-31.0fm.
Beamish, Bernard D.; and Taylor, David G. Apparatus and method for edge stitching/binding workpieces. 3,712,254, Cl. 112-121.290.
Bearden, William G.; and Howard, George C., to Pan American Petroleum Corporation. Multi-layer well screen. 3,712,373, Cl. 166-232.000.
Beaver, Dale M.: *See*—
Murray, Myles N.; and Beaver, Dale M., 3,712,579.
Bebeck, Andrew Henry, to Bell Telephone Laboratories, Incorporated. Domain propagation arrangement. 3,713,119, Cl. 340-174.0tf.
Becavin, Henri, to Thomson-CSF. Transmitter monitors for ILS beacons. 3,713,160, Cl. 343-109.000.
Beckman Instruments, Inc.: *See*—
Durland, Douglas H.; and Ehret, Robert J., 3,713,124.
Becton, Dickinson and Company: *See*—
Genese, Joseph N.; Raprza, Edward J.; Galanaugh, Charles F.; Kennard, Harry M.; Chevalaz, Roger A.; and Smith, John A., 3,712,535.
Beecham Group Limited: *See*—
Cole, Martin; and Planterose, Donald N., 3,712,944.
Beery, Jack, to Burroughs Corporation. Variable printer intensity control. 3,712,212, Cl. 101-93.00c.
Behrenz, Wolfgang: *See*—
Seyberlich, Alfred; Hammann, Ingeborg; and Behrenz, Wolfgang, 3,712,915.
Beilstein, Gunter: *See*—
Husweiler, Arnold; Beilstein, Gunter; Mayer, Adolf; and Paris, Nikolaus, 3,712,912.
Beissbarth, Osmond. Test stand for vehicle brakes. 3,712,128, Cl. 73-126.000.
Bell & Howell Company: *See*—
Kral, Fred G., 3,712,973.
Bell Aerospace Company: *See*—
Andrysiak, Stanislaw J.; and McKenna, Ronald F., 3,712,063.
Bell Telephone Laboratories, Incorporated: *See*—
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Bobeck, Andrew Henry; Ciak, Frank John; and Strauss, Walter, 3,713,120.
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Courtney-Pratt, Jeofry Stuart, 3,712,724.
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Mathews, Max Vernon, 3,712,443.
McPherson, Alan Forbes, 3,713,095.
Sessler, Gerhard Martin; and West, James Edward, 3,711,941.
Turner, Dennis R., 3,713,169.
Williams, James Edgar, 3,712,561.
Bell, William Roland, Jr. Air transfer line. 3,712,336, Cl. 137-613.000.
Belts, Bolts, Cups Corporation: *See*—
Corbett, John M.; and Schenk, Joseph G., 3,712,357.
Bement, Ronald Allan; and Brown, Augustus Boyd, to International Business Machines Corporation. Cavity mold with selectively positioned resilient wall portions. 3,712,575, Cl. 249-91.000.
Bemrose, Colin R.; Brown, Dennis C.; and Turner, William G., to Associated Engineering Limited. Corrugation-forming machines. 3,712,101, Cl. 72-196.000.
Bendix Corporation: *See*—
Sanford, Norman R.; and Vikmanis, Juris, 3,713,139.
Bendix Corporation, The: *See*—
Bach, Lloyd G.; and Ewald, Jerome T., 3,712,177.
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Bendix-Westinghouse Automotive Air Brake Company: *See*—
Deem, Brian C., 3,712,340.
Hoffman, David A., 3,712,685.
Benham, Ralph E., to Purex Corporation, Ltd. Fault or leak detector. 3,713,003, Cl. 317-18.00d.
Bennett, Joseph C.; and Reimer, William A., to GTE Automatic Electric Laboratories Incorporated. Mechanically alterable diode matrix memory. 3,713,110, Cl. 340-173.osp.
Benninger, Arthur C.; and Long, Meletus I., to Tri-Brook, Inc. Semitrailer dump body construction. 3,712,676, Cl. 298-22.00r.
Beregow, Alex. Magnetic thread holder and cutter. 3,712,255, Cl. 112-252.000.
Berg, Louis L., to Creative Tool Company. High energy impact tool assembly. 3,712,390, Cl. 173-132.000.
Bergeron, John A., to General Electric Company. Device for optically determining microbial colony population on growth surface. 3,712,746, Cl. 356-256.000.
Bergmeyer, Hans Ulrich: *See*—
Weimann, Gunter; Haid, Erich; Muhlegger, Klaus; Bergmeyer, Hans Ulrich; Dietmann, Karl; Michal, Gerhard; and Nelboeck-Hochstetter, Michael, 3,712,885.
Bergougnoux, Jean-Claude, to Shell Oil Company. Quick coupling device for LPG containers. 3,712,646, Cl. 285-315.000.
Berkowitz, Sidney; and Mesiah, Raymond N., to FMC Corporation. Chlorination of cyanoric acid. 3,712,891, Cl. 260-248.00c.
Berlin, Aaron S.: *See*—
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Berlin, Zalman Leivikovich; Isarev, Igor Vladimirovich; Vasilchenko, Anatoly Stepanovich; Maslovsky, Gennady Vasilievich; Serkov, Anatoly Gavrilovich; Yakimovich, Hviktor Yakovlevich; and Ivanovsky, Evgeny Alexandrovich, to Gosudarstvenny nauchno-issledovaelsky institut tsvelnykh metallov. Method for removing heat from fluidized bed of roasting furnace and device for effecting the same. 3,712,369, Cl. 165-1.000.
Bernard, Jean C.; and Pascal, Pierre J., to Naphtachimie. Application of adhesive coating to isotactic polypropylene and composition therefor. 3,712,828, Cl. 117-47.00a.
Bernstein, Albert, to RCA Corporation. Mechanical drive mechanism with programmable output function. 3,712,147, Cl. 74-89.220.
Berry, Holland J.; Hardy, William C.; and Zadow, Dale W., to Sun Oil Company. Method for catalytically heating wellbores. 3,712,375, Cl. 166-251.000.
Bertelli, Guido: *See*—
Torti, Luigi; and Bertelli, Guido, 3,712,360.
Bertelsen, Inc.: *See*—
Bertelsen, William R., 3,712,406.
Bertelsen, William R., to Bertelsen, Inc. Ground effect vehicle. 3,712,406, Cl. 180-122.000.
Bertin & Cie: *See*—
Bertin, Jean Henri, 3,712,242.

Bertin, Jean Henri, to Bertin & Cie. Snow and ice track clearer for ground effect machines. 3,712,242, Cl. 104-279.000.

Berzatzy, Paul G. Tennis racket attachment. 3,712,618, Cl. 273-75.000.

Bestehorn, Ute W. Indexed packaging and stacking device. 3,712,463, Cl. 206-65.00r.

Betz, Erwin C. Metallic catalyst and aluminum oxide containing supports from acid leached alloys. 3,712,856, Cl. 204-29.000.

Beutter, Karl, to Audi.NSU Auto Union Aktiengesellschaft. Sealing arrangement for rotary combustion engine. 3,712,767, Cl. 418-121.000.

Bi-Re-Lo, Inc.: *See*—
Lindahl, Paul A., 3,712,510.

Bichard, Frank Rouget: *See*—
East, Frank George; and Bichard, Frank Rouget, 3,712,153.

Billings, William G., to Phillips Petroleum Company. Pyridine-organocopper product and preparation. 3,712,894, Cl. 260-270.000.

Binder, Rolf; and Wildbolz, Rudolf, to Rieter Machine Works, Ltd. Apparatus for feeding fiber material into a chute. 3,712,682, Cl. 302-28.000.

Bio-Medical Sciences, Inc.: *See*—
Chadha, Desh D.; Patel, Babu B.; and Pickett, Charles G., 3,712,141.

Biro, Steven L. Inkster, Mich., to Ford Motor Company. Compound motion transmitting linkage. 3,712,150, Cl. 74-473.00r.

Birtchet, Ralph D.; and Carlson, James O., to Schneider-Simpson, Inc. Screed extension assembly for asphalt paving machine. 3,712,189, Cl. 94-45.00r.

Bitterlich, Walter; and Hesske, Benno. Telescopic optical instrument. 3,712,737, Cl. 356-8.000.

Black, Sivalls & Bryson, Inc.: *See*—
Arenson, Edwin M., 3,712,073.

Blackwell, John; and Buxbaum, Jeanne K., to Du Pont de Nemours, E. I., and Company. Orange to rubine disperse disazo dyes. 3,712,882, Cl. 260-187.000.

Blair, James E.; and Jackson, Richard I., to United States of America, Navy. Aerial dispersal of chemicals. 3,712,219, Cl. 102-7.200.

Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., to General Dynamics Corporation. Method of assembling a measuring and locating system. 3,711,929, Cl. 29-407.000.

Blankenhorn Display, Inc.: *See*—
Blankenhorn, Siegfried C., 3,711,977.

Blankenhorn, Siegfried C., to Blankenhorn Display, Inc. Dimensional display flagger. 3,711,977, Cl. 40-124.100.

Blatt, Leland Francis; and Wiesenhofer, Frank H. Gas exhaust silencer. 3,712,415, Cl. 181-60.000.

Blaw-Knox Company: *See*—
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Bleifeld, Walter: *See*—
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BLH Electronics, Inc.: *See*—
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Blitz, Daniel, to Sanders Associates, Inc. Low data rate displays. 3,713,143, Cl. 343-5.00r.

Blohm, Thomas R.: *See*—
Tilford, Charles H.; Blohm, Thomas R.; and Mac Kenzie, Robert D., 3,712,896.

Blome, Eugene R.; and Fok, Samuel S. M., to Fairchild Camera and Instrument Corporation. Process for making hard surface transparent mask. 3,712,816, Cl. 96-38.300.

Blume, Gerhard: *See*—
Strickrodt, Jorg; and Blume, Gerhard, 3,712,879.

BMR Security Products Corporation, mesne: *See*—
Walters, Russell W., 3,711,894.

Bobeck, Andrew Henry, to Bell Telephone Laboratories, Incorporated. Magnetoresistance detector for single wall domains. 3,713,117, Cl. 340-174.0eb.

Bobeck, Andrew Henry; Ciak, Frank John; and Strauss, Walter, to Bell Telephone Laboratories, Incorporated. Magnetoresistance detector for single wall magnetic domains. 3,713,120, Cl. 340-174.0eb.

Bode, Klaus-Dieter; and Schellhammer, Carl-Wolfgang, to Farbenfabriken Bayer Aktiengesellschaft. 7-Triazolyl-coumarins. 3,712,904, Cl. 260-308.00r.

Boehringer Ingelheim G.m.b.H.: *See*—
Kruger, Gerd; Zipp, Otmar; Keck, Johannes; Nickl, Josef; Machleidt, Hans; Ohnacker, Gerhard; Engelhorn, Robert; and Puschmann, Sigfrid, 3,712,924.

Boehringer Mannheim G.m.b.H.: *See*—
Rittersdorf, Walter; Rey, Hans-Georg; and Rieckmann, Peter, 3,712,853.
Voigtlander, Wolfgang; and Kaiser, Fritz, 3,712,884.

Boersma, Rintje; and Irik, Gijsbert Waldemar, to N.V. "COQ". Conductor arrangement for metal clad electric distributing and/or switching plants for high voltage. 3,712,953, Cl. 174-99.00b.

Boggs, Roger L., to Caterpillar Tractor Co. Method of repairing and servicing lubricated track chains. 3,711,928, Cl. 29-401.000.

Boise Cascade Corporation: *See*—
Fienup, Wilbur G.; and Henderson, James R., 3,712,534.

Boissin, Jean-Claude, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Cryogenic gas trap. 3,712,074, Cl. 62-55.500.

Boltrek, Henry; Hill, Menno E.; Kraft, Joseph K.; and Schirmer, Ernest J. Handrail guide system for passenger conveyor. 3,712,447, Cl. 198-16.000.

Boncorur, Marcel; Heintz, Louis; Langrand, Jean; and Lavaud, Michel, to Commissariat a l'Energie Atomique. Method and device for testing welds by optical spectrography. 3,712,736, Cl. 356-74.000.

Bondowski, Frank M. Storm sash handler. 3,712,482, Cl. 214-1.00r.

Bonn, Helmut; and Randelzhofer, Konrad, to Lenkradwerk Gustav Petri Aktiengesellschaft. Vehicle-steering wheel with horn-actuating baffle plate. 3,712,968, Cl. 200-61.560.

Bonnet, Maurice, to Etablissement Public Agence National de Valorisation De La Recherche Anvar. Method for improving the direct vision of relief slides and equipment for carrying out said method. 3,712,727, Cl. 355-22.000.

Bonyhard, Peter Istvan; and Michaelis, Paul Charles, to Bell Telephone Laboratories, Incorporated. Single-wall domain arrangement. 3,713,116, Cl. 340-174.0tf.

Booth, Franklin W.; and Bruce, Robert A., to United States of America, National Aeronautics and Space Administration. Zero gravity liquid mixer. 3,712,591, Cl. 259-4.000.

Borden Company, The: *See*—
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Borden Inc.: *See*—
Alroy, John D., 3,712,532.

Borkowski, Casimer J.; and Rochelle, James M., to United States of America, Atomic Energy Commission. Digital radiation dosimeter with improved integrating pulse ionization chamber. 3,712,983, Cl. 250-83.60r.

Borton, Richard A.: *See*—
Daniels, William M.; and Borton, Richard A., 3,712,846.

Bosch, Robert, G.m.b.H.: *See*—
Frister, Manfred, 3,713,015.
Gressenich, Klaus; Oppl, Hans; Walter, Berthold; Weismann, Hans; and Zobl, Hartmut, 3,713,067.
Kiess, Albert; Gunsser, Peter; and Kuhn, Edgar, 3,712,283.
Kolb, Frich, 3,711,890.
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Ulbrich, Gerhard; Kuhbauch, Gert; and Fischer, Ernst, 3,711,994.

Bosco, Joseph. Single-line clothes-line. 3,712,556, Cl. 242-100.000.

Bosley, Denis V.: *See*—
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Briar, George M., to Thiokol Chemical Corporation. Hydraulically controlled ditching plow having a counterbalancing wheeled trailer. 3,711,970, Cl. 37-98.000.

Brichant, Francis Jules, to Ferraz, Lucien, et Cie. Fast-acting electrical fuse. 3,713,065, Cl. 337-166.000.

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Continental Can Company, Inc.: *See—*
Erlandson, Paul M., 3,712,022.
Pasternack, George, 3,712,871.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Baumgarten, Wilfried, 3,712,773.
Continental Oil Company: *See—*
Hasz, John W., 3,712,027.
Motz, Kaye L.; and Friend, John, 3,712,923.
Conway, Joseph D. Jet-vibrator-vacuum system and method. 3,711,891, Cl. 15-321.000.
Cook, Albert W.; and Dernovshek, Joseph F., to Goodyear Tire & Rubber Company, The. Graphite and/or carbon disk removable wear face. 3,712,427, Cl. 188-251.00a.
Cook, John S.: *See—*
Staats, William A.; Bosley, Denis V.; Cook, John S.; and Yamasaki, Toshio, 3,712,615.
Yamasaki, Toshio; Cook, John S.; and Staats, William A., 3,712,540.
Cooper, Fredric M., to Northrop Carolina, Inc., mesne. Solid propellant controlled rocket motors. 3,712,058, Cl. 60-207.000.
Cope, F. Troy; and Burrell, James V., to Electric Furnace Company, The. Method and apparatus for heating an elongated metal workpiece. 3,712,596, Cl. 263-6.00r.
Cope, Geoffrey Wilton, to Dresser Industries, Inc. Elastomeric snubbing side bearing. 3,712,691, Cl. 308-138.000.
Copeland, Ernest. Metal foil reflector holder for cooking grills. 3,712,285, Cl. 126-9.00r.
Corbett, John M.; and Schenk, Joseph G., to Belts, Bolts, Cups Corporation. Bolt for attaching elevator buckets to belts, and method of making same. 3,712,357, Cl. 151-41.730.
Corco, Inc.: *See—*
Croley, Thomas E., 3,712,530.
Cordiano, Ettore, to Fiat Societa per Azioni. Hydraulic brake system for vehicles. 3,712,684, Cl. 303-22.00a.
Corll, James A. Child-safe aerosol spray container. 3,712,515, Cl. 222-182.000.
Corning Glass Works: *See—*
Chaney, Harry M., 3,713,134.
Cornsweet, Tom N.; and Crane, Hewitt D., to Stanford Research Institute. Eye tracker. 3,712,716, Cl. 351-7.000.
Costantino, Nicholas: *See—*
Bryan, George D., Jr.; and Costantino, Nicholas, 3,712,023.
Courtney-Pratt, Jeofry Stuart, to Bell Telephone Laboratories, Incorporated. Optical readout apparatus. 3,712,724, Cl. 353-25.000.
Cousin, Barry D., to Plas/Steel Products, Inc. Apparatus for assembling a line guide to a fishing rod. 3,711,919, Cl. 29-200.00p.
Cox, Betty June. Auxiliary bed form structure. 3,711,875, Cl. 5-2.000.
Coyne, James Christopher, to Bell Telephone Laboratories, Incorporated. Mole guidance system. 3,712,391, Cl. 175-26.000.
Craft, Leonard F. Rotary internal combustion engine. 3,712,274, Cl. 123-8.490.
Crane, Hewitt D.: *See—*
Cornsweet, Tom N.; and Crane, Hewitt D., 3,712,716.
Crawford, Gerald J. B., to Schlumberger Technology Corporation. Acoustic logging apparatus for travel time and cement bond logging. 3,712,414, Cl. 181-.50s.
Crawford, Roland Francis: *See—*
Wong, Cho Lun; Jones, Glenson Trevelyn; and Crawford, Roland Francis, 3,713,046.
Creative Tool Company: *See—*
Berg, Louis L., 3,712,390.
Crecelius, John D.: *See—*
Regelson, Ephraim; Sumnicht, Howard I.; and Crecelius, John D., 3,712,054.
Crimmins, James W.; and Pankey, Russell. Microwave receiver and component therefor. 3,713,038, Cl. 333-82.00b.
Crocker, Robert E.: *See—*
Butler, Stuart L.; and Crocker, Robert E., 3,713,062.
Croley, Thomas E., to Corco, Inc. Drum-like container set up from a folded flat of sheet material. 3,712,530, Cl. 229-4.500.
Cronheim, Richard B. Pie cutter and server. 3,711,945, Cl. 30-142.000.
Cross, Benjamin T.; and Posakony, Gerald J., to Automation Industries, Inc. Material tester. 3,712,119, Cl. 73-67.700.
Cross, John Valentine: *See—*
Walmsley, Martin F.; and Cross, John Valentine, 3,712,820.
Crounse, Nathan N.: *See—*
Meunier, Alfred C.; and Crounse, Nathan N., 3,712,982.
Crown Cork & Seal Company: *See—*
Duhan, F. Wm., 3,712,107.
Crumley, J. A.; Hildebrand, James Ross; Kerstetter, Harold Alfred; and Shaak, Ray Ned, to AMP Incorporated. Apparatus for photo etching. 3,712,735, Cl. 355-85.000.
Crump, Robert O.: *See—*
Olney, Frederick D., Jr.; and Crump, Robert O., 3,711,924.
Csaszar, Steve: *See—*
Gabrielian, Henry; and Csaszar, Steve, 3,713,076.
Culbertson, James A.: *See—*
Hyland, William P.; Baird, Roy W.; and Culbertson, James A., 3,712,680.
Cunningham, Edson Wayne, to Royal Industries, Inc. Printing apparatus. 3,712,215, Cl. 101-219.000.
Cunningham, Vernon. Method and apparatus for forming subterranean structures. 3,712,071, Cl. 61-85.000.
Curcio, Michael C.: *See—*
Doe, James B.; Niederberger, Richard P.; Curcio, Michael C.; and Forker, Michael H., 3,712,834.
Curington, Alfred R., to Baker Oil Tools, Inc. Down-hole air hammer. 3,712,388, Cl. 173-78.000.
Currence, Wilburn C., Jr., to Chance, A. B., Company. Climbing assembly having removable steps. 3,712,418, Cl. 182-92.000.
Curtiss-Wright Corporation: *See—*
Jones, Charles, 3,712,766.
Cutler-Hammer, Inc.: *See—*
Halbeck, Werner B., 3,713,055.
Cutter Laboratories, Inc.: *See—*
Ambrus, Laszlo, 3,712,903.
Cuvillier, Roger: *See—*
Cohen-Alloro, Richard; and Cuvillier, Roger, 3,712,476.
Dagiel, Richard T., to Symons Corporation. Waler clamping assembly for a concrete wall form. 3,712,576, Cl. 249-192.000.
Dal Monte, Giorgio, to Societe Italiana Telecomunicazioni Siemens S.p.A. Switching system for interconnected PCM lines. 3,713,106, Cl. 340-172.500.
Dale, Alan M.: *See—*
Martindale, David L.; Dale, Alan M.; Mursinna, Richard C.; and Rewerts, Gene R., 3,712,583.
Dale, John, Limited: *See—*
Brownbill, Thomas Duncan, 3,712,506.
Dalebout, Melvin W. Apparatus for custom fitting boots. 3,711,880, Cl. 12-1.000.
Dalton, John E.; and Lia, Victoria. Folding, rocking, posture adjusting wheel chair. 3,712,671, Cl. 297-258.000.
Dalton, Thomas B., to Westran Corporation. Switch operating mechanism for limit switches. 3,712,965, Cl. 200-17.00r.

Daly, Frank Joseph: *See—*
Falasconi, Rolando; Daly, Frank Joseph; and Purdy, Richard, 3,712,185.

Damico, Armand S. Automatic vehicle alerting signal system. 3,713,094, Cl. 340-66.000.

Dana Corporation: *See—*
Sherman, Donald W., 3,712,641.

Daniel, Arnold; and Richey, Joseph B., II. Method of vacuum casting metal. 3,712,364, Cl. 164-4.000.

Daniels, John F., to Sperry Rand Corporation. Electric dry shaver. 3,711,944, Cl. 30-43.920.

Daniels, William M.; and Borton, Richard A., to Carpenter, L. E., & Company. Acoustical panel. 3,712,846, Cl. 161-43.000.

Danko, Emery A.: *See—*
Griffiths, William C.; and Danko, Emery A., 3,712,026.

Danylchuk, Irynej, to Bell Telephone Laboratories, Incorporated. Single wall domain fanout circuit. 3,713,118, Cl. 340-174.0za.

Darrel, Bernard: *See—*
Weichbrodt, Bjorn; and Darrel, Bernard, 3,712,130.

Dart Industries, Inc.: *See—*
Reves, E. T., 3,712,135.
Woodham, George W.; and Stuart, James L., 3,712,776.

Datametrics Corporation: *See—*
Baker, Arthur Yeaton, 3,713,168.

Datanetics Corporation: *See—*
Miller, Meryl E., 3,712,840.

Davenport, Richard L., to Johnson, S. C., & Son, Inc. Triple seal valve. 3,712,517, Cl. 222-402.130.

David, Sidney, to United States of America, Navy. Omni-steerable cardioid antenna. 3,713,167, Cl. 343-797.000.

Davidowitz, Solomon. Hemorrhoidal support. 3,712,300, Cl. 128-98.000.

Davidson, John P., to Halliburton Company. Method and apparatus for reconditioning the connection between a railway car body and a railway car truck. 3,711,927, Cl. 29-401.000.

Davies, Ben; and Whittemore, Dwight S., to Dresser Industries, Inc. Method of producing high density refractory grain from natural magnesite. 3,712,599, Cl. 263-52.000.

Davies, David H.: *See—*
Rohrer, Kenneth L.; Griswold, Douglas A.; and Davies, David H., 3,712,815.

Davies, James K. Pegboard typewriter. 3,712,442, Cl. 197-2.000.

Davies, Jeffrey B.; and Kendig, Benjamin F., to Tridyne Corporation. Load comparison scale. 3,712,394, Cl. 177-1.000.

Davis, Murray A. Liquid spill collection system. 3,712,330, Cl. 137-312.000.

Davy and United Engineering Company Limited: *See—*
Dowsing, John; and Yeomans, Kenneth Alfred, 3,712,095.

Dawson, Peter Leonard. Controls for valves. 3,712,578, Cl. 251-35.000.

De Geest, Wilfried Florent: *See—*
Van Paesschen, August Jean; Brinckman, Eric Maria; and De Geest, Wilfried Florent, 3,712,812.

De Graaf, Clare J., to Gordon Manufacturing Co. Chair iron and mounting plate therefor. 3,712,672, Cl. 297-306.000.

Dean Brothers Pumps Inc.: *See—*
Streeter, Bert, 3,712,329.

Deans, David Robert, to Imperial Chemical Industries Limited. Gas flow switching method and apparatus. 3,712,028, Cl. 55-67.000.

Debbas, Samir Costandi, to Du Pont de Nemours, E. I., and Company. Process for forming nonwoven webs from combined filaments. 3,711,898, Cl. 19-155.000.

Debortoli, George; and Lukas, Helmut Hans, to Northern Electric Company, Limited. Terminating tool for wires. 3,711,921, Cl. 29-203.00h.

Dechelette, Helen, to AMP Incorporated, mesne. 16 APC Edge connector. 3,713,079, Cl. 339-217.00r.

Decker, John L.: *See—*
Anderson, Norman J.; and Decker, John L., 3,712,434.

Deem, Brian C., to Bendix-Westinghouse Automotive Air Brake Company. Hydraulic and air operated relay valve. 3,712,340, Cl. 137-627.500.

Deere & Company: *See—*
Weakly, Marlin Earle, 3,712,635.

Degn, Ralph G. Pyrotechnic whistle, and method of making. 3,712,223, Cl. 102-31.000.

Deitrick, Rollin E. Artificial lens implant. 3,711,870, Cl. 3-13.000.

Dela Gorgendiere, Choiseul J. J., to Wheel Trueing Tool Company of Canada, Ltd. Diamond drill assembly with bore hole support. 3,712,392, Cl. 175-325.000.

Deltro Corporation: *See—*
Mahon, Joseph J., 3,713,053.

Demaison, Raymond J.: *See—*
Marino, Joseph J.; and Demaison, Raymond J., 3,712,681.

Dennison Manufacturing Company: *See—*
Holovnia, Joseph T.; and Rakauskas, Vitie S., 3,712,449.

Derner, William J.: *See—*
Root, Lawrence E.; Derner, William J.; and Stewart, Harold E., 3,712,693.

Dernovshek, Joseph F.: *See—*
Cook, Albert W.; and Dernovshek, Joseph F., 3,712,427.

Desormiere, Bernard, to Thomson-CSF. System for deflecting magnetic waves utilizing a ferrimagnetic plate. 3,713,049, Cl. 333-7.000.

Dettmer, Hans Juergen Dettmer, to Fischer & Proctor Company. Variable area flowmeter. 3,712,134, Cl. 73-209.000.

Deuschle, Fritz, to Sherwood Medical Industries, Inc. Tray for use in sealing capillary tubes. 3,712,465, Cl. 206-72.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Thiele, Kurt; and von Bebenburg, Walter, 3,712,900.

Diamond Shamrock Corporation: *See—*
Greenbaum, Sheldon B.; Schaaf, Kurt H.; and Klein, Howard C., 3,712,949.
Myers, Clyde B., 3,712,941.

Dias, Fleming, to Zenith Radio Corporation. SWIF's with special polarization for non-linear interactions. 3,713,048, Cl. 332-52.000.

Dickinson, Clarance B. System for use in conducting aircraft check lists. 3,713,090, Cl. 340-27.00r.

Dickstein, George. Protective helmet structure. 3,711,864, Cl. 2-3.00r.

Diehl, Dieter: *See—*
Bartholomaus, Reiner; Diehl, Dieter; and Himmler, Conrad R., 3,712,339.

Diehl, Norman R., to GTE Sylvania Incorporated. Miniature detent mechanism. 3,712,151, Cl. 74-527.000.

Dietmann, Karl: *See—*
Weimann, Gunter; Haid, Erich; Muhlegger, Klaus; Bergmeyer, Hans Ulrich; Dietmann, Karl; Michal, Gerhard; and Nelboeck-Hochstetter, Michael, 3,712,885.

Dietrich, Henri; and Lehmann, Claude, to Ciba-Geigy Corporation. p-Aminoalkylbenzenesulfonamide derivatives. 3,712,899, Cl. 260-294.80f.

Dietrich, Henri; and Lehmann, Claude, to Ciba-Geigy Corporation. p-Carbamoylethylphenylsulfonyl derivatives. 3,712,905, Cl. 260-309.700.

Dietrich, Toni, to Wilhelm, Will KG., Firma. Supporting mount for an instrument stand. 3,712,569, Cl. 248-125.000.

Dietrich, William John. Multiple purpose power tool for portable and bench use. 3,712,751, Cl. 408-20.000.

Dill, Hans G. Rotating ring display. 3,712,046, Cl. 58-45.000.

Dillinger, Robert B.: *See—*
Thorsted, Kenneth G.; and Dillinger, Robert B., 3,712,061.

Dillmann, Eugene Roland. Vehicle overturn preventer. 3,712,405, Cl. 180-104.000.

Dilworth, Robert H., III, to Ortec, Incorporated. Process for particle separation. 3,712,859, Cl. 204-180.00g.

Dixon, Don P. Automobile air conditioning system. 3,712,077, Cl. 62-243.000.

Dod, Louis R.: *See—*
Keller, George C.; Maxwell, Marvin S.; and Dod, Louis R., 3,713,163.

Doe, James B.; Niederberger, Richard P.; Curcio, Michael C.; and Forker, Michael H. Deferred action battery. 3,712,834, Cl. 136-114.000.

Doebel, Karl J.; and Watthey, W. H., to Ciba-Geigy Corporation. Certain oxy-substituted benzo quinolizinium compounds and their use. 3,712,946, Cl. 424-258.000.

Domtar Limited: *See—*
Gartaganis, Phoebus A.; and Harvey, Denis Michael, 3,712,843.

Donaldson Company, Inc.: *See—*
Gronholz, Donald D., 3,712,033.
Swanson, Ian N.; and Wagner, Wayne M., 3,712,416.

Donlon, Richard H.; and Hamilton, William R., to Transportation Technology, Inc. Linear electric motor propulsion system. 3,712,240, Cl. 104-148.0lm.

Donnald, Samuel F. Golfing aid. 3,712,623, Cl. 273-183.00b.

Dorendorf, Heinz, to Siemens Aktiengesellschaft. Semiconductor devices having at least four regions of alternately different conductance type. 3,713,008, Cl. 317-235.00r.

Dorey, Anthony Howard: *See—*
Metcalf, Eric; and Dorey, Anthony Howard, 3,713,023.

Dothan, Felix: *See—*
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Doudlebsky, Ctibor: *See—*
Chrtek, Milan; Doudlebsky, Ctibor; and Kabele, Stanislav, 3,712,042.

Dove, J. B., Inc.: *See—*
Carver, Herbert K., Jr., 3,711,957.

Dow Chemical Company, The: *See—*
Drake, Stevens S.; Lane, George A.; Staudacher, Gerald R.; and Girardin, Donald W., 3,712,233.
Jezic, Zdravko, 3,712,920.
Strycker, Stanley J., 3,712,935.
Weissenberg, Ulrich W., 3,712,838.

Downing, Robert C., to Johnson, Howard, Company. Receptacle packeted sugar, condiments and the like. 3,711,975, Cl. 40-77.800.

Dowsing, John; and Yeomans, Kenneth Alfred, to Davy and United Engineering Company Limited. Slab rolling. 3,712,095, Cl. 72-21.000.

Doyel, John S. Cordless electric garden trimmer with safety lock means. 3,711,949, Cl. 30-264.000.

Drabek, Jozef; and Pissiotas, Georg, to Ciba-Geigy AG. Imidazolylaklyl-thio]hosphates and thiophosphonates. 3,712,909, Cl. 260-309.000.

Dracon Industries: *See—*
Mason, John R., 3,711,947.

Drake, Stevens S.; Lane, George A.; Staudacher, Gerald R.; and Girardin, Donald W., to Dow Chemical Company, The. Caseless pyrotechnic smoldering munition. 3,712,233, Cl. 102-103.000.

Drcsak, Frank. Geographical game. 3,711,966, Cl. 35-40.000.

Dresser Industries, Inc.: *See—*
Cope, Geoffrey Wilton, 3,712,691.
Davies, Ben; and Whittemore, Dwight S., 3,712,599.

Drexhage, Martin G., to Textron Inc. Reverse flow internally-cooled rocket engine. 3,712,059, Cl. 60-258.000.

Driskell, Carl R.; and Owen, Joseph R., to United States of America, Navy. Sweep generator with automatic centering. 3,713,000, Cl. 315-24.000.

Drohomirecky, Walter. Toothbrush which dispenses toothpaste. 3,712,747, Cl. 401-155.000.

Drushel, Robert W., to Ex-Cell-O Corporation. Diode-capacitor charge and discharge circuit. 3,713,010, Cl. 320-1.000.

Du Pont de Nemours, E. I., and Company: *See—*
Armstrong, William M., Jr.; Edwards, Webster H.; and Vining, Roy H., 3,712,745.
Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, 3,712,513.
Blackwell, John; and Buxbaum, Jeanne K., 3,712,882.
Debbas, Samir Costandi, 3,711,898.
Gerjovich, Henry J., 3,712,806.
Jelinek, Arthur G., 3,712,936.
Middleton, William J., 3,712,902.
Middleton, William J., 3,712,929.
Ross, Francis Joseph, 3,712,858.
Sansom, William; and Thompson, Fred W., 3,712,796.

Du Pont, Michael H.: *See—*
Lang, Paul Wentworth, 3,712,202.

Duben, Franklin T., to Honeywell Information Systems Inc. Memory cell for an associative memory. 3,713,115, Cl. 340-173.0am.

Ducloux, Maurice; and Gruffaz, Max, to Rhone-Poulenc S.A. Polyimide compositions. 3,712,933, Cl. 260-857.0pi.

Duconge, Claude: *See—*
Laurent, Jean; and Duconge, Claude, 3,713,085.

Dudzinski, Zdzislaw W.; and Wakeman, Reginald L., to Millmaster Ony & Corporation. Amphoteric surface-active agents. 3,712,918, Cl. 260-501.110.

Dugard, C., Limited: *See—*
Ruffle, William H.; and Hemsley, Brian C. (said Hemsley assor. to), 3,712,399.

Duhan, F. Wm., to Crown Cork & Seal Company. Apparatus for and method of stripping containers from metal working punches. 3,712,107, Cl. 72-345.000.

Duker, Dorothy J., to Vistron Corporation. Hopper loading extrusion apparatus. 3,712,775, Cl. 425-186.000.

Dunlap, Harold E., to Lodding Engineering Corporation. Blade holding apparatus. 3,711,888, Cl. 15-256.510.

Dunlop Holdings Limited: *See—*
Thacker, Stephen E. W., 3,712,326.

Duquesne, Jean-Claude: *See—*
Constantin, Jean-Pierre; Duquesne, Jean-Claude; and Pontier, Michel, 3,712,341.

Dura Tufting GmbH: *See—*
Hartung, Josef, 3,712,845.

Durland, Douglas H.; and Ehret, Robert J., to Beckman Instruments, Inc. Temperature telemetering apparatus. 3,713,124, Cl. 340-209.000.

Dwyer, Francis Bosworth; Thompson, Richard Lawrence; and Wulff, Eberhard, to Colonial Sugar Refining Company, Limited, The. High speed sorting. 3,712,469, Cl. 209-111.700.

Dyer, Gordon A.; and King, Scoby N. Portable shooting bench. 3,711,984, Cl. 42-94.000.

Dzus Fastener Co., Inc.: *See—*
Schenk, Peter, 3,712,355.

Eargle, William R., Jr., to Westinghouse Electric Corporation. Lighting fixture for U-bent fluorescent lamps. 3,712,981, Cl. 240-51.120.

East, Frank George; and Bichard, Frank Rouget, to Combined Engineered Products Limited. Incremental gear drive. 3,712,153, Cl. 74-687.000.

Eastman Kodak Company: *See—*
Beach, David E., 3,712,200.
Eckerdt, George H.; and Ewald, William P., 3,711,905.
Eckerdt, George H., 3,712,725.
Gramza, Eugene Patrick, 3,712,827.
Harris, James E.; and Watson, Robert L., 3,712,743.
Johnson, Robert B.; and Smith, Craig E., 3,712,558.
Letson, George M.; Whitman, Robert J.; and Scott, James J., Jr., 3,713,021.
Lorenzini, Raymond; and Klinkert, Helmuth J., 3,712,554.
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Eaton Yale & Towne, Inc.: *See—*
Fox, William L., 3,712,076.

Ebauches Bettlach S.A.: *See—*
Bachmann, Peter, 3,712,048.

Eberle, Jurg, to Ferag, Fehr & Reist AG. Apparatus for stacking flat surface-like objects. 3,712,487, Cl. 214-6.0ba.

Eberle, Otto Eugen. Ring of two precious metal parts, one overlapping and embedding the other along the ring band portion. 3,712,079, Cl. 63-15.000.

Eberly, Harry G.: *See—*
Nolt, Edwin B.; Eby, Richard R.; and Eberly, Harry G., 3,712,654.

Eby, Richard R.: *See—*
Nolt, Edwin B.; Eby, Richard R.; and Eberly, Harry G., 3,712,654.

Eckel, Oliver C. Sound absorbing device. 3,712,413, Cl. 181-33.0ge.

Eckerdt, George H.; and Ewald, William P., to Eastman Kodak Company. Slide holder. 3,711,905, Cl. 24-263.0pc.

Eckerdt, George H., to Eastman Kodak Company. Adapter for slide projector. 3,712,725, Cl. 353-68.000.

Ecodyne Cooking Products Company: *See—*
Forchini, James F.; and Herndon, Brian K., 3,712,631.

Ecodyne Cooling Products Company: *See—*
Furlong, Donn B.; Forchini, James F.; and Luzaich, Samuel, 3,712,760.

Edison, Lamonte R., to General Motors Corporation. Pulse length multiplier circuit. 3,712,993, Cl. 307-267.000.

Edmisson, Russell C.: *See—*
Starr, Stanley R.; and Edmisson, Russell C., 3,712,538.

Edoco Technical Products, Inc.: *See—*
Worson, Lee, 3,712,188.

Edstrom, Gene H.; and Irwin, John W., to International Business Machines Corporation. Branch control for a digital machine. 3,713,108, Cl. 340-172.500.

Edwards, Webster H.: *See—*
Armstrong, William M., Jr.; Edwards, Webster H.; and Vining, Roy H., 3,712,745.

Eebuisser, Jean-Claude A.: *See—*
Castets, Michel G. M.; Colin, Jean-Marie H.; and Eebuisser, Jean-Claude A., 3,713,152.

Egger, Joseph; Meitinger, Heinz; and Schwartz, Herbert, to Timex Corporation. Day-date timepiece with multiple display of dates and days of week. 3,712,043, Cl. 58-5.000.

Eggert, Walter S., Jr., to Budd Company, The. Coupling structure for joining containers. 3,711,902, Cl. 24-81.00c.

Ehret, Robert J.: *See—*
Durland, Douglas H.; and Ehret, Robert J., 3,713,124.

Eibe, Werner W., to Blaw-Knox Company. Combination rolling mill. 3,712,102, Cl. 72-238.000.

Einarsson, Einar. Pneumatic anti-skid vehicle tire. 3,712,358, Cl. 152-208.000.

Ekberg, Carl E.: *See—*
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EKCO Products, Inc.: *See—*
Logemann, George H.; and Voelz, Gerhardt G., Jr., 3,712,021.

Eldon Industries, Inc.: *See—*
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Electric Furnace Company, The: *See—*
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Electro Development Corporation: *See—*
Harris, Carl L.; Rama, Leighton C.; and Soward, Dallas V., 3,712,122.

Electronic Engineering Company of California: *See—*
Gabrielian, Henry; and Csaszar, Steve, 3,713,076.

Elineau, Hubert, to Etablissements R. Senard & Fils. Automatic distributor of long objects such as bars or similar items. 3,712,458, Cl. 198-219.000.

Elitex, Zavody textilniho strojirenstvi, generalni reditelstvi: *See—*
Hanousek, Alois; and Kase, Oldrich, 3,712,526.

Ellenburg, George W., to Westinghouse Electric Corporation. Reverse osmosis module. 3,712,473, Cl. 210-321.000.

Elliott, Eldon G. Apparatus for handling magnetically attractive material. 3,712,472, Cl. 210-222.000.

Elliott, Gilbert Leslie, to Northern Electric Company Limited. Crossbar switches. 3,713,054, Cl. 335-112.000.

Ellis Corporation: *See—*
Toth, Alex, 3,712,089.
Toth, Alex; and Fesmire, Robert H., 3,712,090.

Elsbett, Gunter; and Elsbett, Ludwig, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method and apparatus for forming ring grooves and piston lands on a stell piston, especially for internal combustion engines. 3,712,099, Cl. 72-107.000.

Elsbett, Ludwig: *See—*
Elsbett, Gunter; and Elsbett, Ludwig, 3,712,099.

Emerson Electric Co.: *See—*
Parlow, John, 3,712,581.
Roddy, Joseph T.; and Page, Wayne L., 3,712,438.
Wightman, Lawrence W.; and Long, Thomas J., 3,712,632.

Emery, Jerry A.: *See—*
Uyeda, Leon R.; and Emery, Jerry A., 3,712,714.

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Ende, Don S. Over-snow vehicle. 3,712,396, Cl. 180-5.000.

Engel, Joseph C., to Westinghouse Electric Corporation. Circuit breaker including improved overcurrent protective device. 3,713,005, Cl. 317-33.00r.

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Ennis, George Thomas. Vehicle spraying and scrubbing device. 3,711,883, Cl. 15-97.00r.

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Erlandson, Paul M., to Continental Can Company, Inc. Shock wave application of twist-off crowns. 3,712,022, Cl. 53-42.000.
Eschbach, Robert C.; and Colligan, John B., to Aztec Manufacturing Company. Extrusions for partitions, walls and enclosures. 3,712,005, Cl. 52-210.000.
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Evans, Mervyn Thomas Arthur; Irons, Laurence Ian; and Mitchell, John Richard, to Lever Brothers Company. Edible oil emulsions. 3,712,865, Cl. 252-312.000.
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Falconer, Errol Linton, to Canadian Industries Limited. Method of gelling water bearing compositions containing thickeners. 3,712,866, Cl. 252-316.000.
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Faragosa, Ernest. Automobile aerial location signal. 3,712,263, Cl. 116-28.000.
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Fay, James P. Safety grenade. 3,712,218, Cl. 102-70.200.
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Feather, Jack Vincent; and Walker, John W., said Walker assor. to said Feather, Jack Vincent. Exercising machine. 3,712,613, Cl. 272-58.000.
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Field, Thomas R. Ventilated open-air indoor broiler having damper means and control therefor. 3,712,819, Cl. 99-400.000.
Fienup, Wilbur G.; and Henderson, James R., to Boise Cascade Corporation. Pressurized dough container. 3,712,534, Cl. 229-51.0bp.
Fier, Edward J., Jr., to United States Steel Corporation. Chick feeder lid structures. 3,712,270, Cl. 119-61.000.
Fink, Roy W., to Vecta Group, Inc., The. Stackable chair with foldable tablet arm. 3,712,668, Cl. 297-162.000.
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Fisher, John P. Nuclear reactor control rod. 3,712,852, Cl. 176-86.000.
Fisher, William F., to Caterpillar Tractor Company. Adjustable pinion for motor grader circle drive. 3,712,384, Cl. 172-796.000.
Fisk, Edwin J. Bug catcher and ejector. 3,711,987, Cl. 43-134.000.
Fitzgerald, J. Vincent; Matusik, Frank J.; and Oppliger, Hans R., to National Metal and Refining Company, Inc. High precision wide dynamic range viscous loss measuring apparatus. 3,712,117, Cl. 73-59.000.
Flemino, Reginald B., to Golden Age Industries. Portable check protector. 3,712,213, Cl. 101-108.000.
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Gildersleeve, Benjamin T. Machine for detasseling corn. 3,712,035, Cl. 56-63.000.
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Girard, Donald J., to National Cash Register Company, The. Logic for color bar printer. 3,713,138, Cl. 340-347.00d.
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Gradone, Frank P. Swab device for medical specimens. 3,712,296, Cl. 128-2.00w.
Gramza, Eugene Patrick, to Eastman Kodak Company. Radiographic screen. 3,712,827, Cl. 117-33.50r.
Granfield, John S. Material removal device. 3,712,174, Cl. 90-12.000.
Grasso, Albert P.; and Stedman, James K., to United Aircraft Corporation. Wet bulb temperature sensor. 3,712,140, Cl. 73-338.000.
Grasso, Vito A.; and Frankel, Michael S., to Budd Company, The. Vacuumized container for a parachute. 3,712,568, Cl. 244-148.000.
Graziani, Danio, to International Standard Electric Corporation. Automatic time control circuit. 3,712,994, Cl. 307-293.000.
Greathouse, Russell E. Toe holder. 3,712,271, Cl. 119-96.000.
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Greene, Harry A., Jr.; and Wing, Charles, to Remler Company. Blood pressure measuring devices with variable frequency recorder and linearized leak means. 3,712,297, Cl. 128-2.05q.
Greenwald, Harry, to Greenwald Industries, Inc. Coin slide assembly for receiving a coin standing on edge. 3,712,440, Cl. 194-55.000.
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Grybek, Roland S.; and Johnston, Frederick B., to Marketing and Research Services, Inc. Composition and method for treating plants and trees. 3,712,803, Cl. 11-79.000.
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Guberman, Jerald; and Snaper, Alvin A., to Advanced Patent Technology, Inc. Ultra-sonic dry-cleaning machine. 3,712,085, Cl. 68-3.0ss.

Guichard, Jean, to Centre d'Etudes Techniques des Industries de l'Habillement. Device for the displacement and alignment of pieces of flexible material in sheet form. 3,712,612, Cl. 271-54.000.

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Halern, Alfred; and Samor, Ernest J., to Synergistics, Inc. Antiperspirant action by bimetallic salts of cluconic, glucuronic and galactusionic acids. 3,712,948, Cl. 424-68.000.

Hall, James M.; and Clipp, Louis L., to Exotech Incorporated. Apparatus for generating pulsed jets of liquid. 3,712,543, Cl. 239-102.000.

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Hamersma, J. Warren; and Caserio, Frederick F., Jr., to Atlantic Richfield Company. Chlorofluorination of olefins. 3,712,931, Cl. 260-653.700.

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Hamshere, Wilfred Charles; and Atkinson, Thomas William Lancaster, to Marchon Products Limited. Method for sampling plant fluids. 3,712,795, Cl. 23-230.00r.

Handler, George S.; Foote, Kenneth R.; and Burford, Milton K., to United States of America, Navy. Target marker warhead. 3,712,228, Cl. 102-60.000.

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Hanzel, Joseph W., to United States of America, Navy. Decoy flare with traveling ignition charge. 3,712,224, Cl. 102-37.600.

Hara, Atsushi; Naganuma, Hisao; and Takai, Akio, to Nippon Kokan Kabushiki Kaisha. Connector for a millmeter waveguide. 3,712,644, Cl. 285-39.000.

Haraikawa, Tetsuo; Kondo, Sadao; and Yazawa, Hiromi, to Tokico Ltd. Disk brake assembly. 3,712,422, Cl. 188-72.300.

Hardy, William C.: *See—*
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Harmon, Albert D., to Maremont Corporation. Yarn joining assembly for automatic yarn piecing apparatus. 3,712,040, Cl. 57-34.00r.

Harnau, Hans-Dieter: *See—*
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Harris, James E.; and Watson, Robert L., to Eastman Kodak Company. Apparatus for detecting and measuring yarn defects and irregularities. 3,712,743, Cl. 356-200.000.

Harris, Robert A. Method of forming metal. 3,712,105, Cl. 72-307.000.

Harris, Samuel M.: *See—*
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Harrod, Jimmie A., to Moore Busines' Forms, Inc. Ink roller fountain. 3,712,216, Cl. 101-363.000.

Hartmann-Hansen, Tore, to Worthing Turbine International Inc. Overspeed detector for rotary member. 3,712,145, Cl. 73-491.000.

Hartung, Josef, to Dura Tufting GmbH. Tile floor covering and method covering a floor surface. 3,712,845, Cl. 161-38.000.

Hartzell, Carl Daniel, to Raymond International, Inc. Filling sand drain holes. 3,712,066, Cl. 61-11.000.

Harvey, Alan R.: *See—*
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Hasegawa, Yo: *See—*
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Hashimoto, Kazuo. Telephone answering and recording device. 3,713,039, Cl. 179-6.00r.

Hassett, James W.; and Ihde, William M., to Environeering, Inc. Sound suppressing system. 3,712,412, Cl. 181-33.00d.

Hasuo, Shigetsuyo: *See—*
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Hasz, John W., to Continental Oil Company. Vapor adsorption process for recovering selected components from a multi-component gas stream. 3,712,027, Cl. 55-33.000.

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Hazemag GmbH: *See—*
Von Conrad, Eugene; Rosner, Kurt; and Meyer, Ludwig, 3,712,550.

Hazy, Andrew C., to Horizons Incorporated; division of Horizons Research Incorporated. Dry working photosensitive compositions comprising organic halogen compounds, ethylene compounds and carbinol compounds. 3,712,817, Cl. 96-48.00r.

Healey, Anthony John, to Bell Telephone Laboratories, Incorporated. Fluidic half-adder. 3,712,323, Cl. 137-81.500.

Healy, James W., to Cambridge Engineering Inc. Indexing. 3,712,750, Cl. 408-3.000.

Heatcoat, Edgar H. Fuel blender. 3,712,592, Cl. 259-108.000.

Heberlein Hispano S.A.: *See—*
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Heidenreich, Karl Heinz, to Goltermann, Wandel u. Registration of noise level in communication systems. 3,713,112, Cl. 340-173.00r.

Heimel, Othmar: *See—*
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Heintz, Louis: *See—*
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Held, Gerhard R. Self-air cooling abrading wheel. 3,711,999, Cl. 51-206.00r.

Helm, Herbert W.; and Barthalow, Henry D., to Smithe, F. L., Machine Company, Inc. Retractable gummer die for envelope machines. 3,712,265, Cl. 118-212.000.

Hemsley, Brian C.: *See—*
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Hemstreet, Harold S., to Character Recognition Corporation, mesne. Method and apparatus for identifying letters, characters, symbols and the like. 3,713,099, Cl. 340-146.30d.

Hemstreet, Harold S., to Character Recognition Corporation, mesne. Method and apparatus for identifying letters, characters, symbols, and the like. 3,713,100, Cl. 340-146.30y.

Henderson, James R.: *See—*
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Hengelhaupt, Hans-Georg; and Teichmann, Friedrich, to Triumph Werke Nuernberg A.G. Device to cast off wound ribbon from a spool. 3,712,446, Cl. 197-175.000.

Henkes, John L., Jr., to General Electric Company. Compostie back projection screen and method of forming. 3,712,707, Cl. 350-122.000.

Hennig, Fridolin: *See—*
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Hennings, Klaus. Method for the automatic alignment of two articles to be brought into register with one another. 3,712,740, Cl. 356-152.000.

Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Unsaturated quaternary alkylated fatty acids and derivatives. 3,712,922, Cl. 260-410.90r.

Henschen, Homer Ernst; and Huffnagle, Clifton Wesley, to AMP Incorporated. Electrical connections to flat conductor cable. 3,713,072, Cl. 339-17.00f.

Hensen, Friedheim: *See—*
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Hensley, James R. Air operated spring brake. 3,712,178, Cl. 91-170.00r.

Herbener, Henry M. Garments for women. 3,712,308, Cl. 128-519.000.

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Herter, Martin. Ball and socket pipe joint. 3,712,645, Cl. 285-95.000.

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Hickinbotham, William Percy. Suspension unit for vehicle seats. 3,712,603, Cl. 267-131.000.

Higgins, Roger K.; and Sheets, Andrew T., to United States of America, Navy. Synchro-to-digital conversion method and apparatus. 3,713,141, Cl. 340-347.0sy.

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Hill, Harold J.; and Thigpen, David Ross, to Shell Oil Company. Oil recovery process using an emulsion modifier-containing dilute aqueous surfactant system. 3,712,377, Cl. 166-252.000.

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Hill, William L., to Sun Oil Company. Multiple fracturing process. 3,712,379, Cl. 166-297.000.

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Hillinger, Bruno; Nikowitz, Johann; and Schwarz, Michael, to Waagner-Biro Aktiengesellschaft. Silo container respectively silo construction. 3,712,002, Cl. 52-63.000.

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Hiraga, Ken-Ichi, to Taisei Kensetsu Kabushiki Kaisha. Method for introducing a prestress to a cylindrical concrete structure. 3,711,935, Cl. 29-452.000.

Hirsch, Abraham Adler. Upflow distributive trays for fractionating columns and absorption towers. 3,712,595, Cl. 261-114.00r.

Hirt, Wilhelm; Ringelmann, Heinz; Weckesser, Ernst; and Weinhold, Gottfried, to Vereinigte Aluminium Werke Aktiengesellschaft. Molding machine. 3,712,785, Cl. 425-405.000.

Hobson, H. M., Limited: *See—*
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Hoffman, David A., to Bendix-Westinghouse Automotive Air Brake Company. Dual circuit brake valve. 3,712,685, Cl. 303-52.000.

Hoffman, Herbert N., to General Electric Company. Gear unit oil seal and support. 3,712,152, Cl. 74-606.00r.

Hoffman, Murray, to International Telephone and Telegraph Corporation. Aircraft landing systems. 3,713,159, Cl. 343-102.000.

Hoffmann, Oswald, to Hoffmann-Werke J., Oswald Hoffmann. Firing equipment for simulating gunfire. 3,712,230, Cl. 102-70.20r.

Hoffmann-La Roche Inc.: *See—*
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Holsapple, Jerry Raymond: *See—*
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Holt, Ralph. Alignment device. 3,711,955, Cl. 33-181.00r.

Holt, Wythe W. Article dispensing apparatus and method. 3,712,507, Cl. 221-82.000.

Honeywell Inc.: *See—*
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Honeywell Information Systems Inc.: *See—*
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Hopfer, Samuel, to General Microwave Corporation. Variable microwave attenuator. 3,713,037, Cl. 333-81.00a.

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Horizons Incorporated; division of Horizons Research Incorporated: *See—*
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Hornung, Louis Michael, to International Business Machines Corporation. Diminished matrix method of 1/0 control. 3,713,109, Cl. 340-172.500.

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Hosokawa, Masuo; Yokoyama, Tohei; Suzuki, Teruaki; Aki, Yoshiaki; and Tokui, Masahiko, to Kabushiki Kaisha Hosokawa Funtaikogaku Kenkyusho. Device for grinding synthetic resin or like having low melting temperature into powder. 3,712,551, Cl. 241-88.000.

Hosokawa, Minoru, to Kabushiki Kaisha Suwa Seikosha. Electromagnetic switch assembly. 3,713,056, Cl. 335-206.000.

Hosokawa, William T.: *See—*
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Houssa, Marcel Goerges Jean. Process and machine for the toasting of cut bread. 3,712,480, Cl. 214-1.00q.

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Huang, Barney K., to Research Corporation. Seedling growing and handling device. 3,712,252, Cl. 111-2.000.

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Hunnicutt, Wayne E., to Applied Power Industries, Inc. Freely positionable force distributing device. 3,712,108, Cl. 72-446.000.
Hunnicutt, William R., Jr. VLF active sonar. 3,713,083, Cl. 340-3.00r.
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Hurst, Robert L., to Ball Corporation. Apparatus for transferring articles. 3,712,453, Cl. 198-41.000.
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Jacquot, Michel Jules; Amicel, Charles Gustavf; and Renaudon, Marie Michel, to Centre d'Etudes Techniques des Industries de l'Habillement. Suction gripping apparatus. 3,712,611, Cl. 271-11.000.
Jaeger, Walter. Textile dry cleaning machine. 3,712,088, Cl. 68-18.00c.
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Jansen, Theodore J., to Pitney-Bowes, Inc. Annular fluidic control device. 3,712,320, Cl. 137-81.500.
Janssen, Albert T., to Atlantic Richfield Company. Mining method. 3,712,677, Cl. 299-13.000.
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Jennings, Doris E. Scrubber mitt for bathing. 3,711,889, Cl. 15-227.000.
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Johnson, Frederick O., to Westinghouse Electric Corporation. Converter apparatus. 3,713,012, Cl. 321-27.00r.
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Jones, Charles, to Curtiss-Wright Corporation. Rotary internal combustion engine with low starting drag. 3,712,766, Cl. 418-88.000.
Jones, Elwyn, to Koehring Company. Thin walled thermoplastic pressure vessels particularly for carbonated beverages and methods of making same. 3,712,497, Cl. 215-1.00c.
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Kaempfen, Henry Xavier, to American Cyanamid Company. Bis-pyrid oxazole-stilbene derivatives for optical brightening. 3,712,888, Cl. 260-240.0ca.
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Kalopissis, Gregoire; Gascon, Jean; Gallien, Jacqueline; Bugaut, Andree; and Gaston-Breton, Hubert, to Societe Anonyme dite: L'Oreal. Dyeing human hair and composition for including an oxidation dye and heterocyclic coupler thereof. 3,712,158, Cl. 8-11.000
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Kalus, Serge, to Cegedur GP. Device for fixing panels and assembly. 3,712,013, Cl. 52-584.000.
Kaneko, Tamaki; and Mizuno, Katsumi, to Ricoh Co., Ltd. Copy sheet discharge device with removable rollers. 3,712,214, Cl. 101-232.000.
Kantrowitz, Arthur R.; Gerry, Edward T.; Leonard, Donald A.; and Wilson, Jack, to Avco Corporation. Apparatus for and method of providing population inversion. 3,713,030, Cl. 330-4.300.
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Kasper, Cass S.; and Rott, Vernon, to Inter-Lakes Engineering Co. Machine and process for assembling cathodes. 3,711,923, Cl. 29-203.00l.
Katzman, Frederick. Swimming pool cover. 3,711,873, Cl. 4-172.120.
Kaufman, Harry. Strip-chart recorder with paper supply in replaceable cartridge. 3,713,170, Cl. 346-136.000.
Kaufmann, Michael, to Messerschmitt-Bolkow-Blohm GmbH. Rocket engine exhaust nozzle with boundary layer control. 3,712,546, Cl. 239-265.110.
Kawada, Toshio. Digital indicating machine. 3,712,050, Cl. 58-125.00c.
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Kaye, Gordon E., to Mallory, P. R., & Co., Inc. Reserve cell with modular construction. 3,712,835, Cl. 136-114.000.
Keady, Frederick D.; and Silagy, Richard J., to Weatherhead Company, The. Brake warning switch. 3,712,683, Cl. 303-6.00c.
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Keiner, Heinz; Kessler, Arthur; and Schafer, William, to Leitz, Ernst, G.m.b.H. Automatic lap dissolve for motion picture cameras. 3,712,721, Cl. 352-91.000.
Keledy, Francis C.; and Notvest, Kenneth R., to Trodyne Corporation. Acoustic emission crack monitor. 3,713,127, Cl. 340-261.000.
Kell, Robert Christopher, to General Electric Company, Limited, The. Microwave devices. 3,713,051, Cl. 333-73.00r.
Keller, George C.; Maxwell, Marvin S.; and Dod, Louis R., to United States of America, National Aeronatuics and Space Administration. Plural beam antenna. 3,713,163, Cl. 343-754.000.
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Ketterer, Edmund, to Kroewerath, S. L., & Co., Firma. Oscillator with electrodynamic drive and electromagnetic detection, especially for use in an electronic clock. 3,713,047, Cl. 331-116.00m.

Key, Joe Wayne; and Russell, Larry Rayner, to Fluor Ocean Services, Inc. Method and system for laying a pipeline from a reel barge. 3,712,100, Cl. 72-161.000.

Kice, Jack W.; and Vanderlip, Herbert D., to K-B Engineering Company. Air operated timing mechanism. 3,712,337, Cl. 137-624.140.

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Kiess, Albert; Gunsser, Peter; and Kuhn, Edgar, to Bosch, Robert, G.m.b.H. Safety arrangement for starting motor in internal combustion engines. 3,712,283, Cl. 123-179.00a.

Kieves, Garry. Self-actuating record jacket holder. 3,712,477, Cl. 211-40.000.

Kimuro, Tadao; and Ataniya, Takeshi, to Nippon Kokan Kabushiki Kaisha. Method of improving the surface of galvanized steel material. 3,712,826, Cl. 117-22.000.

Kincaid, Frederick L., to Esco Corporation. Chain link fixture. 3,712,456, Cl. 198-175.000.

Kinemotive Corporation: *See*—
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King, Ralph J., to Ford Motor Company. Vent window hinge. 3,711,893, Cl. 16-128.000.

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Kinoshita, Hidejiro: *See*—
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Kinsel, Tracy Stewart, to Bell Telephone Laboratories, Incorporated. Stabilized mode-locked laser arrangement. 3,713,042, Cl. 331-94.500.

Kirchner, Henry P. Method of strengthening ceramic material by glazing and quenching. 3,712,830, Cl. 117-125.000.

Kirkland, Norman; and Rachlinski, Stanley, to Hill-Rom Company, Inc., mesne. Tilt bed. 3,711,876, Cl. 5-62.000.

Kishi, Hirotoshi; Igarashi, Yousuke; and Tano, Takeo, to Iwatsu Electric Co., Ltd. Automatic control device for the toner concentration within a developer in an electrostatic copy machine. 3,712,203, Cl. 95-89.00r.

Kisselmann, Willy; Rumpelein, Fritz; and Kopf, Paul, to Agfa-Gevaert Aktiengesellschaft. Indicating instrument with pivotable scales. 3,712,262, Cl. 116-129.00r.

Kitajima, Susumu, to Kurita Machinery Manufacturing Company, Limited. Mechanism for automatically transporting filter plates in filter press. 3,712,460, Cl. 198-221.000.

Kitani, Hiroshi; Yoshida, Kenichi; Ohtsubo, Hideo; and Kuroda, Masataka, to Sumitomo Electric Industries, Ltd. Leaky waveguide line. 3,713,052, Cl. 333-84.00r.

Kito, Masahior: *See*—
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Kiuchi, Hiroshi; and Takezaqa, Yoshio, to Toray Industries, Inc. Weatherable, high impact, thermoplastic resin composition. 3,712,934, Cl. 260-876.00r.

Kiyokawa, Yasumasa; Ogawa, Yoshihisa; Ono, Akira; Fukumasu, Kazuichi; and Sugisaki, Hiroyuki, to Sakata Shokai, Co., Ltd. Easily dispersible pigment and process for producing same. 3,712,824, Cl. 106-308.00m.

Kizakisz, Iliasz; and Horvath, Vilmos, to Medicor Muvek. Stethoscope. 3,712,409, Cl. 181-24.000.

Klein, Howard C.: *See*—
Greenbaum, Sheldon B.; Schaaf, Kurt H.; and Klein, Howard C., 3,712,949.

Klein, Norbert, to Porsche, Dr.-Ing. H.c.F., K.G., Firma. Lock for a removable rood attachment for vehicles. 3,712,665, Cl. 296-137.00r.

Kline, William M. Centrifuge tube. 3,712,295, Cl. 128-2.00f.

Klinkert, Helmuth J.: *See*—
Lorenzini, Raymond; and Klinkert, Helmuth J., 3,712,554.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
May, Oswald, 3,712,664.

Knabe, Uwe; Gust, Arno; and Hinxlage, Alois, to Holstein & Kappert, Maschinenfabrik Phonix GmbH. Method and apparatus for the application of caps to bottles or the like. 3,712,017, Cl. 53-43.000.

Kneissl, Franz, to Kneissl, Franz, Skifabrik. Implement handle. 3,712,659, Cl. 294-57.000.

Kneissl, Franz, Skifabrik: *See*—
Kneissl, Franz, 3,712,659.

Knipe, Earl A., to Rex Chainbelt Inc. Length-adaptable rotary mower blade. 3,712,037, Cl. 56-295.000.

Kobayashi, Toyoaki; Kondo, Toshio; and Sakakibara, Naoji, to Aisin Seiki Kabushiki Kaisha. Wear indicating arrangement for brake linings of disc brakes. 3,713,091, Cl. 340-52.00a.

Koble, Robert L., Jr.; and Goettl, John M., to Ghiz, George J. Pool cleaning apparatus. 3,712,313, Cl. 134-167.00r.

Koehring Company: *See*—
Jones, Elwyn, 3,712,497.
Meyer, Walter E., 3,712,125.
White, James C.; and Emge, Gene F., 3,712,771.

Koff, Irwin; New, Ronald D.; and Holladay, Samuel P., to United States of America, Navy. Extractor tab. 3,712,169, Cl. 89-1.50d.

Kofink, Siegfried. Thermal-mechanical energy transducer device. 3,712,053, Cl. 60-23.000.

Kofsky, Harvey, to Canadian Marconi Company. Lightweight doppler navigator. 3,713,151, Cl. 343-7.500.

Kohler, Henning, to AEG-Elotherm GmbH. Apparatus for detecting a short circuit across gap by comparing the gap voltage with a delayed portion thereof. 3,713,020, Cl. 324-51.000.

Kohorn, Alfred O. Dial and cylinder knitting machine having self-frictioning needles. 3,712,082, Cl. 66-19.000.

Kohzuma, Sadao; Hasuo, Shigetsuyo; Tada, Kenichi; and Itoh, Takayuki, to Takachiho Koeki Kabushiki Kaisha. High speed pattern mass memory device. 3,713,113, Cl. 340-173.0rc.

Kolb, Frich, to Bosch, Robert, GmbH. Windshield wiper. 3,711,890, Cl. 15-250.340.

Kollisch, Gustav: *See*—
Muller, Walter; Mayr, Hubert; Weinrotter, Ferdinand; Frohner, Walter; Presoly, Elfriede; and Kollisch, Gustav, 3,712,804.

Kollmorgen Corporation: *See*—
Norton, Bruce, 3,712,980.

Kondo, Sadao: *See*—
Haraikawa, Tetsuo; Kondo, Sadao; and Yazawa, Hiromi, 3,712,422.

Kondo, Toshio: *See*—
Kobayashi, Toyoaki; Kondo, Toshio; and Sakakibara, Naoji, 3,713,091.

Kondo, Tsukasa: *See*—
Mase, Toshio; and Kondo, Tsukasa, 3,712,972.

Kopera, Anthony, to Bowles Fluidics Corporation. Vortex proximity sensor with increased sensing range. 3,712,318, Cl. 137-13.000.

Kopf, Paul: *See*—
Kisselmann, Willy; Rumpelein, Fritz; and Kopf, Paul, 3,712,262.

Koppers Company: *See*—
Lopez, John, 3,712,486.

Koppers Company, Inc.: *See*—
Lulie, Albert L.; and Harper, Paul D., 3,712,186.

Korver, Jan Abraham Cornelis: *See*—
Smeulers, Wouter; Hovens, Paulus Joseph Maria; and Korver, Jan Abraham Cornelis, 3,712,999.

Kovacec, Viktor. Strip cutting unit for looms. 3,712,344, Cl. 139-11.000.

Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, to Shinetsu Chemical Company. Method for preparing cellulose ether derivatives. 3,712,886, Cl. 260-226.000.

Kozlowski, Tadeusz; and Pemberton, Ernest H., to Owens-Illinois, Inc. Notch sensing control system for a partition assembly machine. 3,712,183, Cl. 93-37.00r.

Kraft, Joseph K.: *See*—
Boltrek, Henry; Hill, Menno E.; Kraft, Joseph K.; and Schirmer, Ernest J., 3,712,447.

Kral, Fred G., to Bell & Howell Company. Dual speed machine handling magnetically stripe cards and cards therefor. 3,712,973, Cl. 235-61.11r.

Kratz, Hans Otto; Schurman, Heinz Peter; and Steiner, George. Die and method of manufacture. 3,712,157, Cl. 76-107.00r.

Kraus, Helmut, to Fichtel & Sachs A.G. Clutch assembly. 3,712,435, Cl. 192-70.270.

Kraus, Joseph H.: *See*—
Silby, Harry; and Silby, Harry, deceased, 3,712,940.

Kraus, Richard B.: *See*—
Musschoot, Albert; and Kraus, Richard B., 3,712,459.

Krause, Gerhard, to Fernseh G.m.b.H. Analog delay circuit using storage diodes. 3,712,988, Cl. 307-221.00r.

Krauss-Maffei A. G.: *See*—
Lidl, Rolf, 3,712,778.

Kreske, Walter J.: *See*—
Versoy, Irving R., 3,712,431.

Kreutzer, Thomas F., to L. S. T. Interprises. Dual purpose dump and transport vehicle. 3,712,491, Cl. 214-505.000.

Krispin Engineering Limited: *See*—
Maynard, James G.; and Brown, George F., 3,712,078.

Kristof, Herbert. Waistband for trousers, skirts and the like. 3,711,868, Cl. 2-237.000.

Krjutchenko, Evgenia Georgievna: *See*—
Serebryakova, Tatyana Andreevna; Zakharychev, Ardalion Vladimirovich; Chigir, Rimma Nuriakhmetova; Anachenko, Sofia Nikolaevna; Torgov, Igor Vladimirovich; and Krjutchenko, Evgenia Georgievna, 3,712,910.

Kroewerath, S. L., & Co., Firma: *See*—

Ketterer, Edmund, 3,713,047.
Kruger, Gerd; Zipp, Otmar; Keck, Johannes; Nickl, Josef; Machleidt, Hans; Ohnacker, Gerhard; Engelhorn, Robert; and Puschmann, Sigfrid, to Boehringer Ingelheim G.m.b.H. Halo-substituted 2-aminobenzylamine-amides and salts thereof. 3,712,924, Cl. 260-558.0a.
Krumm, Charles G.: *See—*
Napor, Carl A.; and Krumm, Charles G., 3,712,553.
Krupp, Fried., Gesellschaft mit beschrankter Haftung: *See—*
Pelzer, Hans, 3,712,457.
Kruse, Walter M., to Hercules Incorporated. Tetraneopentyltitanium. 3,712,874, Cl. 260-429.500.
Krutsinger, Jack K.: *See—*
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Munson, Robert E.; Krutsinger, Jack K.; and Polson, Jerry H., 3,713,166.
Kryczko, Henry: *See—*
Staschke, Marvin A.; and Kryczko, Henry, 3,712,052.
Kubo, Moritada, to Tokyo Shibaura Electric Co., Ltd. Conveyor type transport device. 3,712,234, Cl. 104-25.000.
Kubo, Moritada, to Tokyo Shibaura Electric Co., Ltd. Apparatus for generating pulse trains with predetermined adjecent pulse spacing. 3,713,026, Cl. 235-152.000.
Kugler, Tibor, to Lonza Ltd. Stabilization of plasma generators. 3,712,996, Cl. 313-231.000.
Kuhbauch, Gert: *See—*
Ulbrich, Gerhard; Kuhbauch, Gert; and Fischer, Ernst, 3,711,994.
Kuhlman Electric Company: *See—*
Fisher, John L.; and Wilks, Alan L., 3,713,066.
Kuhn, Edgar: *See—*
Kiess, Albert; Gunsser, Peter; and Kuhn, Edgar, 3,712,283.
Kuhn, Falk, to Foquet-Werk & Planck. Jacquard pattern controller structure. 3,712,084, Cl. 66-156.000.
Kuhn, Karl Walter, to Societe d'Etudes de Machines Termiques. Device for a clamping and loosening the exhaust manifold on internal combustion engines. 3,712,064, Cl. 60-272.000.
Kuhn, Karl Walter, to Societe dEtudes de Machines Thermiques. Rocker-arm assembly for internal combustion engines. 3,712,278, Cl. 123-90.390.
Kuhn, Richard B., to North American Aviation, Inc. Apparatus and information processing methods for a tracking system tracker unit. 3,712,957, Cl. 178-6.800.
Kuhnle, Willi, to Zahnradfabrik Friedrichshafen Aktiengesellschaf. Control mechanism for fluid-operated vehicular transmission. 3,712,156, Cl. 74-858.000.
Kulik, Leo; and Gustenau, Gustav, to Franz Lipowsky Sagen- und Maschinenmesserfabrik, Firma. Saw blade for a frame saw having teeth with reinforced edges. 3,712,348, Cl. 83-835.000.
Kummer, Helmut, to Telefunken Patentverwertungs G.m.b.H. Radar. 3,713,154, Cl. 343-9.000.
Kump, Ernest Joseph. Building system and components therefor. 3,712,007, Cl. 52-79.000.
Kuramochi, Shigeaki. Pencil sharpener. 3,712,351, Cl. 144-28.720.
Kuramoto, Yoshio; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Shutter speed indicating device for electrically controlled shutter mechanisms. 3,712,193, Cl. 95-10.00c.
Kurczyk, Heinz-Georg; Wuhrer, Josef; and Ottenheym, Adrian, to Rheinische Kalksteinwerke GmbH. Process for the production of synthetic indialite. 3,712,768, Cl. 423-328.000.
Kurita Machinery Manufacturing Company, Limited: *See—*
Kitajima, Susumu, 3,712,460.
Kuroda, Masataka: *See—*
Kitani, Hiroshi; Yoshida, Kenichi; Ohtsubo, Hideo; and Kuroda, Masataka, 3,713,052.
Kuroyanagi, Rikuo: *See—*
Takagi, Nobuo; and Kuroyanagi, Rikuo, 3,712,528.
Kusber, Leo: *See—*
Massaglia, Leondro A., 3,712,236.
Kushigian, Anthony. Automatic drill pointing machine with automatic drill locater system. 3,711,997, Cl. 51-105.00r.
Kuwertz, Erich, to Pfalzstahlbau G.m.b.H. Endless towing conveyor. 3,712,241, Cl. 104-172.00s.
Kuzel, Norbert R.; and Havanagh, Frederick W., to Lilly, Eli, and Company. Automated system for performing sample measurement, dilutions and photometric measurements. 3,712,144, Cl. 73-421.00r.
L. S. T. Interprises: *See—*
Kreutzer, Thomas F., 3,712,491.
La Palme, Camille V.: *See—*
Hallock, Edward C.; Olsen, Robert W.; and Viehmann, George A., 3,712,003.
La Rosa, Paul J.: *See—*
Brown, Marinus L.; La Rosa, Paul J.; and Sciulli, Charles M., Jr., 3,712,602.
Labatt, John, Limited: *See—*
Walmsley, Martin F.; and Cross, John Valentine, 3,712,820.
Laddouceur, Harold A.; and Matthews, John H., to Multifastener Corporation. Method of forming fastener strip. 3,711,931, Cl. 29-412.000.
Lafferty, Gary S., Sr., to Milwaukee Electric Tool Corporation. Depth adjusters and interchangeable locators for screwdrivers. 3,712,352, Cl. 144-32.000.
Lafleur, Clovis L.: *See—*
Gollwitzer, Lee H.; and Lafleur, Clovis L., 3,712,410.
Lafley, Karen V.: *See—*
Zentmeyer, John E., Jr., 3,712,292.
Lagerlof, Rolf Ove Esbjorn; Sjoholm, Lennart Stig; and Svensson, Thomas Lars-Gustav, to Telefonaktiebolaget LM Ericsson. Antenna for strip transmission lines. 3,713,165, Cl. 343-711.000.
Laimins, Eric, to BLH Electronics, Inc. Compound-plate strain gage transducer. 3,712,123, Cl. 73-141.00a.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Boissin, Jean-Claude, 3,712,074.
Lamka, Charles E.; and Atkins, Walter J. Apparatus and process for dispensing icy material. 3,712,019, Cl. 53-29.000.
Lammers, Sidney G.; Ciarlone, Anthony N.; and Carrock, Frederick E., to Rexall Drug and Chemical Company. Composition comprising acrylonitrile-butadiene-styrene polymer beads coated with NN' ethylene bis stearamide. 3,712,872, Cl. 260-23.70n.
Lanam, Richard D.: *See—*
Shapiro, Stanley; Goldman, Alan J.; Tyler, Derek E.; and Lanam, Richard D., 3,712,837.
Landis, Donald E., to National Cash Register Company, The. Color bar printer. 3,712,210, Cl. 101-93.00c.
Landthaler, Anton, to Veitscher Magnesitwerke-Aktien-Gesellschaft. Heating installation for heating particulate raw materials. 3,712,600, Cl. 263-32.00r.
Lane, George A.: *See—*
Drake, Stevens S.; Lane, George A.; Staudacher, Gerald R.; and Girardin, Donald W., 3,712,233.
Lang, Paul Wentworth, 1/2 to Du Pont, Michael H. Multiple shutter system for cameras and projectors. 3,712,202, Cl. 95-58.000.
Lang, Robert, to CIBIE Projecteurs. Device for compensating for the variations of the viscosity of a fluid in a hydraulic circuit depending on its temperature. 3,712,342, Cl. 138-46.000.
Lange, Karl Heinz, to Balda Werke Photographische Gerate und Kunststoff R. Gruter Kommanditgesellschaft. Camera viewer. 3,712,196, Cl. 95-11.00v.
Lange, Karl-Heinz, to Balda-Werke. Control mechanism for cameras. 3,712,201, Cl. 95-39.000.
Langrand, Jean: *See—*
Boncorur, Marcel; Heintz, Louis; Langrand, Jean; and Lavaud, Michel, 3,712,736.
Lanier Electronic Laboratory, Inc.: *See—*
Nye, William M.; and Jones, Stanley W., 3,712,961.
Larson, Charles L., to Jeddeloh Bros. Sweed Mills, Inc. Apparatus for stacking sheets. 3,712,608, Cl. 271-68.000.
Latash, Jury Vadimovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; and Baglai, Vitaly Mikhailovich, 3,712,365.
Laurent, Jean; and Duconge, Claude, to Institut Francais du Petrole, des Carburants et Lubrifiants. Acoustic wave receiver for underwater seismic prospecting. 3,713,085, Cl. 340-7.000.
Lavaud, Michel: *See—*
Boncorur, Marcel; Heintz, Louis; Langrand, Jean; and Lavaud, Michel, 3,712,736.
Laven, Charles M. Bulkhead door. 3,712,663, Cl. 296-24.000.
Lawrence, Kenneth C., to Aluminum Company of America. Container closure. 3,712,498, Cl. 215-38.00r.
Lazecki, Stanislaw Vincent, to United Aircraft Corporation. Digital symbol generator. 3,713,135, Cl. 340-324.00a.
Le Blanc, Robert B. Portable beer dispenser. 3,712,514, Cl. 222-146.00c.
Le Grand, Joseph A.; and Fuhrman, Ari. Corneal contact lens. 3,712,718, Cl. 351-160.000.
Leadore, Toney C.: *See—*
Little, Vincent C.; Berlin, Aaron S.; and Leadore, Toney C., 3,712,217.
Lear Siegler, Inc.: *See—*
Motz, Carl H.; and Anthony, Russell W., 3,712,094.
Learson, Robert J.: *See—*
Ronsivalli, Louis J.; and Learson, Robert J., 3,712,821.
Lech, Richard J.; and Reinebach, Lawrence R., to International Harvester Company. Variable displacement pump. 3,712,758, Cl. 417-214.000.
Lederer, Josef, to Agfa-Gevaert Aktiengesellschaft. Apparatus for guiding the marginal portions of wide and narrow strips of photosensitive material or the like. 3,712,732, Cl. 355-72.000.
Lee, Raymond Organization, Inc., The: *See—*
Busby, John T., 3,712,662.
Jarosinski, Louis, 3,711,872.
Lee, Stanley Arnold, to Imperial Chemical Industries, Limited. Process for making aryloxymethyl-morpholines. 3,712,890, Cl. 260-247.70c.
Lee-Norse Company: *See—*
Amoroso, Michael J., 3,712,678.
Amoroso, Michael J., 3,712,679.
Lehmann, Claude: *See—*
Dietrich, Henri; and Lehmann, Claude, 3,712,899.
Dietrich, Henri; and Lehmann, Claude, 3,712,905.
Lehmann, Kenneth G., to Norco, Inc. Eccentric-actuated hook-type fastening device. 3,712,653, Cl. 287-20.924.
Lehner, Francis E.; and Miller, Wayne F., to California Institute of Technology. Remotely operated seismometer. 3,713,088, Cl. 340-17.000.
Lehnhoff, Richard N., to General Motors Corporation. Generator field coil energizing reversing circuit. 3,713,016, Cl. 322-28.000.
Leidy, Lester R., Jr.: *See—*
Weaver, John A.; Brandt, Carl Raymond; and Leidy, Lester R., Jr., 3,712,143.

Leitz, Ernst, Fa., G.m.b.H.: *See—*
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Leitz, Ernst, G.m.b.H.: *See—*
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Keiner, Heinz; Kessler, Arthur; and Schafer, William, 3,712,721.
Lek-Trol, Inc.: *See—*
McKeown, William L., 3,712,987.
Lemelson, Jerome H. Information system. 3,712,956, Cl. 178-6.60a.
Lenkradwerk Gustav Petri Aktiengesellschaft: *See—*
Bonn, Helmut; and Randelzhofer, Konrad, 3,712,968.
Leon, Henry. Band safety lock for watch bands and the like. 3,711,906, Cl. 24-265.0ws.
Leonard, David L. Collapsible tent device. 3,712,316, Cl. 135-1.00a.
Leonard, Donald A.: *See—*
Kantrowitz, Arthur R.; Gerry, Edward T.; Leonard, Donald A.; and Wilson, Jack, 3,713,030.
Leonard, Merrill G., to Westinghouse Electric Corporation. Quick make and break plug-in connector for a high voltage and high current circuit. 3,713,077, Cl. 339-111.000.
Leonhardt, Joseph H., Jr.; Lunsford, Jack I., Jr.; Sharpe, Bynum B.; and Templin, Charles T., to Western Electric Company, Incorporated. Digital rack wiring station. 3,711,926, Cl. 29-203.00b.
Lepage, Marc D. Drying device. 3,711,958, Cl. 34-88.000.
Letchworth, Peter E., to Stauffer Chemical Company. Cultivation of large sized larvae. 3,712,269, Cl. 119-51.000.
Letson, George M.; Whitman, Robert J.; and Scott, James J., Jr., to Eastman Kodak Company. Sensitometer for photoconductive materials. 3,713,021, Cl. 324-32.000.
Lever Brothers Company: *See—*
Evans, Mervyn Thomas Arthur; Irons, Laurence Ian; and Mitchell, John Richard, 3,712,865.
Levine, Seymour D., to Squibb, E. R., & Sons, Inc. Acenaphthene derivatives. 3,712,925, Cl. 260-558.00a.
Leviton Manufacturing Co., Inc.: *See—*
Poliak, John M.; and Lopez, Juan M., 3,713,071.
Levsky, Alexandr Alexandrovich Modze: *See—*
Galimov, Ravil Khusainovich; and Levsky, Alexandr Alexandrovich Modze, 3,712,159.
Lia, Victoria: *See—*
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Liang, Charles C.: *See—*
Bro, Per; Liang, Charles C.; and Boyle, Gerard H., 3,712,836.
Liautaud, Jean Alphonse Eugene. Offshore installation for producing, storing an loading oil from underwater oil well. 3,712,068, Cl. 61-46.500.
Lich, Richard L., to General Steel Industries, Inc. Automatically power banked resilient railway car truck. 3,712,245, Cl. 105-164.000.
Lich, Richard L., to General Steel Industries, Inc. Elastomerically articulated railway truck. 3,712,246, Cl. 105-196.000.
Lidl, Rolf, to Krauss-Maffei A. G. Mold for the casting for foamable synthetic resins. 3,712,778, Cl. 425-242.000.
Lidstrom, Tord V. A. Supply means for a continuous paper strip in printing office machines. 3,712,445, Cl. 197-133.00r.
Lienhard, Otto E., to Canrad Precision Industries, Inc. Instrument for transmitting ultraviolet radiation to a limited area. 3,712,984, Cl. 250-86.000.
Liesch, Jean; and Removille, Jacques, to Acieries Reunies de Burbach-Eich-Dudelange S.A., ARBED and Gradel S.A., Societe Luxembourgloise pour l'Industrie Nucleaire. Relatively short air lock for transfer of relatively long objects. 3,711,993, Cl. 49-68.000
Ligones, Hubert: *See—*
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Lilly, Eli, and Company: *See—*
Kuzel, Norbert R.; and Havanagh, Frederick W., 3,712,144.
Padgitt, Howard R., 3,712,979.
Lindahl, Paul A., to Bi-Be-Lo, Inc. Pill and capsule dispenser. 3,712,510, Cl. 221-260.000.
Lindeborg, Georg, to Norba Aktiebolag. Refuse containers with an emptying hood and a charging screw. 3,712,494, Cl. 214-519.000.
Linderman, Roger C.; and Cline, Charles D., to Story Chemical Corporation, mesne. Flame retardant composition for textiles. 3,712,789, Cl. 8-116.00p.
Lindgren, Ivar: *See—*
Wennerblom, Bengt Axel; Udden, Per Edward Carl; Udden, Anna Britt; and Lindgren, Ivar, 3,712,305.
Linnerooth, John D.; and Rosen, Erhardt W., to International Business Machines Corporation. Test bit pattern generator for pattern recognition machines. 3,713,097, Cl. 340-146.3ed.
Linton, Richard H.; and Sonoda, George, to International Business Machines Corporation. Data regeneration scheme for stored charge storage cell. 3,713,114, Cl. 340-173.00r.
Lipinsky, Frederick C. Conveyance for transporting objects with protruding legs. 3,712,638, Cl. 280-79.100.
Lipp, James P., to General Electric Company. High density data recording and error tolerant data reproducing system. 3,713,123, Cl. 340-174.10g.
Lippitsch, Josef M.: *See—*
Gilli, Paul Viktor; Fritz, Kurt; Lippitsch, Josef M.; and Lurf, Gunther, 3,712,370.
Lippmann, Henry E.: *See—*
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Poppinger, Herbert; and Liska, Manfred, 3,713,009.
Littlcomputers, Inc.: *See—*
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Little, Arthur D., Inc.: *See—*
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Little, Vincent C.; Berlin, Aaron S.; and Leadore, Toney C., to United States of America, Army. Dispenser launched air arming bomb fuze. 3,712,217, Cl. 102-4.000.
Litton Systems, Inc.: *See—*
Burnham, Fred E., 3,713,158.
Skinner, Clayton H.; and Sick, Paul J., 3,712,841.
Litty, Thomas P.; Moss, Ellsworth R.; and Rice, Edward J., to TRW Inc. Hybrid transistor. 3,713,006, Cl. 317-101.00a.
Llewellyn, Peter M., to Varian Associates. Flow control for gas analyzing apparatus. 3,712,111, Cl. 73-23.100.
Lo Presti, Philip F.: *See—*
Florsheim, Leonard S., Jr.; Archer, Harold B.; Lo Presti, Philip F.; and Sutherland, Thurlow J., 3,712,730.
Locante, John: *See—*
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Lockwood Corporation: *See—*
Ririe, Max H.; Roland, Murray C.; and Olson, Rich, 3,712,544.
Lodding Engineering Corporation: *See—*
Dunlap, Harold E., 3,711,888.
Loebsack, Victor H. Building construction system. 3,712,004, Cl. 52-265.000.
Loeffler, Donald E.; Hussey, George D.; Smith, George; and Wortel, Johannes M., to Shell Oil Company. Synthetic hydrocarbon based grease compositions. 3,712,864, Cl. 252-28.000.
Lofaso, Gerald F.: *See—*
Miller, Darwin A., 3,712,115.
Logan, John S.: *See—*
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Colovas, Denny D.; Logan, John S.; and Skruch, Richard R., 3,712,239.
Logemann, George H.; and Voelz, Gerhardt G., Jr., to EKCO Products, Inc. Container closure apparatus. 3,712,021, Cl. 53-329.000.
Loggins, John T.: *See—*
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Lohrer, G. L. Rexroth, Eisenwerk GmbH: *See—*
Bartholomaus, Reiner; Diehl, Dieter; and Himmler, Conrad R. (said Diehl and said Bartholomaus assors. to), 3,712,339.
Long, Meletus I.: *See—*
Benninger, Arthur C.; and Long, Meletus I., 3,712,676.
Long, Thomas J.: *See—*
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Lonza Ltd.: *See—*
Kugler, Tibor, 3,712,996.
Lopez, John, to Koppers Company. Stacker assembly for corrugated sheets and the like. 3,712,486, Cl. 214-6.00s.
Lopez, Juan M.: *See—*
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L'Oreal: *See—*
Morane, Bruno P.; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, 3,712,501.
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Lorenzini, Raymond; and Klinkert, Helmuth J., to Eastman Kodak Company. Apparatus for winding a plurality of web rolls of various widths and radii at a single winding station. 3,712,554, Cl. 242-56.200.
Lostumon, Arthur J., to Motorola, Inc. Apparatus for laterally correcting the position of the blue beam in a CRT. 3,713,057, Cl. 335-212.000.
Loveless, Stanley M., to General Gas Light Company. Reset operator for pressure fluid valve. 3,712,577, Cl. 251-23.000.
Lovendale, Mark R. Billfold. 3,712,354, Cl. 150-38.000.
Lowell, Ross. Portable soft-light assembly. 3,712,978, Cl. 240-1.300.
LRI Corporation: *See—*
Bosma, George O., 3,712,712.
Lucerne Products, Inc.: *See—*
Sahrbacker, Edward V., 3,713,070.
Lueking, James R.: *See—*
Abel, Carroll; Clifton, John R.; and Lueking, James R., 3,712,232.
Luginbuhl, David E., to Apollo Plastic & Machines Co., Inc. Position adjusting bar for injection molding machine. 3,712,779, Cl. 425-242.000.
Lukas, Helmut Hans: *See—*
Debortoli, George; and Lukas, Helmut Hans, 3,711,921.
Lulie, Albert L.; and Harper, Paul D., to Koppers Company, Inc. Method of and apparatus for forming stacks of a preselected number of blanks. 3,712,186, Cl. 93-93.00m.
Lundin, Erik L., to Hansson, Sven, & Co. AB. Method of folding and bundling large sacks. 3,712,018, Cl. 53-21.0fw.
Lunsford, Jack I., Jr.: *See—*
Leonhardt, Joseph H., Jr.; Lunsford, Jack I., Jr.; Sharpe, Bynum B.; and Templin, Charles T., 3,711,926.
Luperti, Harry E.; Reid, Robert R.; and Waber, Anthony, to Pitney-Bowes, Inc. Method and apparatus for handling tape. 3,712,527, Cl. 226-136.000.
Lurf, Gunther: *See—*
Gilli, Paul Viktor; Fritz, Kurt; Lippitsch, Josef M.; and Lurf, Gunther, 3,712,370.
Lutz, George J. Compact analyzer for hair-like fibers. 3,712,124, Cl. 73-95.000.
Luxembourg, Henry. Wrist watch shield. 3,712,049, Cl. 58-105.000.

Luzaich, Samuel: *See—*
Furlong, Donn B.; Forchini, James F.; and Luzaich, Samuel, 3,712,760.

Lyshkow, Norman A., to Pollution Monitors, Inc. Colorimeter with gas scrubber assembly. 3,712,792, Cl. 23-254.00r.

Lyshkow, Norman A. Method and apparatus for analysis of gas streams. 3,712,793, Cl. 23-232.00e.

Mac Kenzie, Robert D.: *See—*
Tilford, Charles H.; Blohm, Thomas R.; and Mac Kenzie, Robert D., 3,712,896.

Machleidt, Hans: *See—*
Kruger, Gerd; Zipp, Otmar; Keck, Johannes; Nickl, Josef; Machleidt, Hans; Ohnacker, Gerhard; Engelhorn, Robert; and Puschmann, Sigfrid, 3,712,924.

MacInnes, William F.: *See—*
Moskowitz, Arthur; MacInnes, William F.; and Sumrall, Calhoun W., 3,712,226.

Macinnis, Joseph Beverly. Small portable underwater observation and communication chamber. 3,712,070, Cl. 61-69.000.

Mack Trucks, Inc.: *See—*
Pelizzoni, Winton J.; Baumbaugh, Charles R.; and Calliss, William A., 3,712,420.

Mackness, Frederich Vincent Summersford; Cheetham, John Norman; and Watson, Victor Jack, to Ronson Corporation. Article and method for preventing escape of pyrophoric material. 3,712,168, Cl. 86-1.000.

MacMillan Bloedel Limited: *See—*
Admiraal, Lambertus, 3,712,971.

Mag-ar Optikai Muvek: *See—*
Paulik, Jeno; and Paulik, Ference, 3,712,110.

Maggioni & C., S.p.A.: *See—*
Carissimi, Massimo; and Ravenna, Franco, 3,712,928.

Magnasco, Peter L. Pool chlorinator. 3,712,511, Cl. 222-52.000.

Magrini Fabbriche Riunite Magrini Scarpa e Magnano M.S.M.S.p.A.: *See—*
Calvino Y Teijeiro, Benito Jose, 3,712,969.

Mahon, Joseph J., to Deltro Corporation. Reset timer. 3,713,053, Cl. 335-75.000.

Maier, John E.: *See—*
Patel, Kalyanji U.; and Maier, John E., 3,712,877.

Majestic Wax Company: *See—*
Strauss, Don S., 3,711,886.

Majors, Oliver W. Electric outlet and lead-through device. 3,713,078, Cl. 339-130.00c.

Malegue, Aime, to Cefilac. Method and apparatus for the hot piercing of metal billets. 3,712,103, Cl. 72-264.000.

Mallet, Maurice: *See—*
Gattus, Jean; and Mallet, Maurice, 3,712,831.

Mallory, P. R., & Co., Inc.: *See—*
Bro, Per; Liang, Charles C.; and Boyle, Gerard H., 3,712,836.
Kaye, Gordon E., 3,712,695.
Kaye, Gordon E., 3,712,835.

Maltenfort, Martin S. Pressure steam setting process. 3,712,791, Cl. 8-149.100.

Manco Manufacturing Co.: *See—*
Valente, Raymond L., 3,712,161.

Mancy, Denise; Ninet, Leon; and Preud'Homme, Jean, to Rhone-Poulence S.A. Antibiotic 18 887 R. P. 3,712,945, Cl. 424-118.000.

Mangels, Theodore F.: *See—*
McLelland, Jack I.; and Mangels, Theodore F., 3,712,261.

Mann, James U.: *See—*
Nudenberg, Walter; Harvey, Merlin P.; and Mann, James U., 3,712,878.

Manner Plastic Materials, Inc.: *See—*
Tochner, Irving A.; and Savinsky, Walter T., 3,712,590.

Manufacture des Montres Rolex S.A.: *See—*
Girard, Pierre, 3,712,047.

Manzi, Mathew. Universal replaceable drill for marble, metals and wood. 3,712,753, Cl. 408-224.000.

Mar-Com Development, Inc.: *See—*
Martin, John R., 3,712,974.

Marathon Oil Company: *See—*
Allred, Victor D., 3,712,855.

Marcatili, Enrique Alfredo Jose, to Bell Telephone Laboratories, Incorporated. Air clad optical fiber waveguide. 3,712,705, Cl. 350-96.0wg.

Marchaj, Tadeusz Josef, to Preload Engineering Company, The. Liner for cryogenic container. 3,712,500, Cl. 220-9.0lg.

Marchon Products Limited: *See—*
Hamshere, Wilfred Charles; and Atkinson, Thomas William Lancaster, 3,712,795.

Maremont Corporation: *See—*
Harmon, Albert D., 3,712,040.

Marin, Glenn R., to Carborundum Company, The. Reinforced carbon bodies. 3,712,428, Cl. 188-251.00a.

Marino, Joseph J.; and Demaison, Raymond J., to Pfizer Inc. Pneumatic conveying apparatus for light material. 3,712,681, Cl. 302-20.000.

Marke, Douglas John Burrows; and Thompson, Peter George, to Imperial Chemical Industries Limited. Explosive charge assembly and its use in seismic prospecting. 3,712,220, Cl. 102-23.000.

Marketing and Research Services, Inc.: *See—*
Grybek, Roland S.; and Johnston, Frederick B., 3,712,802.
Grybek, Roland S.; and Johnston, Frederick B., 3,712,803.

Marsan, Arthur E., to Starch seal and appliance for ostomy. 3,712,304, Cl. 128-283.000.

Marshall, Richard P.: *See—*
Braden, William D.; and Marshall, Richard P., 3,711,996.

Marshall, William R. Horn blower fishing rod holder. 3,713,131, Cl. 340-279.000.

Martin, Duane Paul. Apparatus for supporting and retaining low density webs. 3,712,649, Cl. 285-397.000.

Martin, John R., to Mar-Com Development, Inc. Computational hexadecimal slide rule. 3,712,974, Cl. 235-70.00r.

Martin, Marcel. Apparatus for nurturing trees. 3,711,992, Cl. 47-48.500.

Martin, Stephen J. Pulse interrogation article-sorting system. 3,713,102, Cl. 340-152.00t.

Martin, William E. Large capacity scraper unit construction. 3,711,971, Cl. 37-124.000.

Martindale, David L.; Dale, Alan M.; Mursinna, Richard C.; and Rewerts, Gene R., to Ametek, Inc. Valved for lines carrying extreme temperature fluids. 3,712,583, Cl. 251-149.400.

Martinez, Eugene, to Reibel, Robert W. Photographic viewer. 3,712,726, Cl. 353-68.000.

Martinez, Felix Jesus, to Baxter Laboratories, Inc. Positive pressure lid for dialyzer apparatus. 3,712,475, Cl. 210-321.000.

Martinez, Flelix Jesus, to Baxter Laboratories. Artifical kidney apparatus. 3,712,474, Cl. 210-321.000.

Martini, Gyorgy: *See—*
Gabor, Zoltan; Szanto, Jozsef; and Martini, Gyorgy, 3,712,462.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Elsbett, Gunter; and Elsbett, Ludwig, 3,712,099.

Mase, Toshio; and Kondo, Tsukasa, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electric lighter plug with interlocking means. 3,712,972, Cl. 219-267.000.

Maslovsky, Gennady Vasilievich: *See—*
Berlin, Zalman Leivikovich; Isarev, Igor Vladimirovich; Vasilchenko, Anatoly Stepanovich; Maslovsky, Gennady Vasilievich; Serkov, Anatoiy Gavrilovich; Yakimovich, Hviktor Yakovlevich; and Ivanovsky, Evgeny Alexandrovich, 3,712,369.

Mason, Donald E.: *See—*
George, Warren T.; and Mason, Donald E., 3,711,878.

Mason, John R., to Dracon Industries. Shearable protective molding and shear. 3,711,947, Cl. 30-179.000.

Mason, Peter Alan, to Wickman Machine Tool Sales Limited. Adjustable support structures for machine tools. 3,711,998, Cl. 51-166.0mh.

Mason, Robert W.; and Prochaska, Frank O., to Shell Oil Company. Method of oil cut determination. 3,712,118, Cl. 73-61.10r.

Massaglia, Leondro A., 1/2 to Kusber, Leo. Meat hook retainer. 3,712,236, Cl. 104-93.000.

Mastertape (Magnetic) Limited: *See—*
Armer, Herbert Leslie, 3,713,130.

Masuda, Yasuo; and Tsukamoto, Magohei, to Yamaha Hatsudoki Kabushiki Kaisha. Suspension system for an endless belt traction vehicle. 3,712,402, Cl. 180-5.00r.

Mathews, Max Vernon, to Bell Telephone Laboratories, Incorporated. Apparatus and method for spacing or kerning typeset characters. 3,712,443, Cl. 197-84.00a.

Matsuda, Kazuo; Tanaka, Yoshiaki; Sakai, Takeyo; and Iwasa, Ichiro, to Kao Soap Co., Ltd. Process for polymerization of tetrahydrofuran. 3,712,930, Cl. 260-615.00b.

Matsumura, Masakatsu, to Kawasaki Jukogyo Kabushiki Kaisha. Vehicle speed alarming device. 3,713,093, Cl. 340-62.000.

Matsushita Electric Industrial Company Limited: *See—*
Murakami, Yoshinobu; Hasegawa, Yo; and Morimoto, Kazuhisa, 3,712,811.

Mattel, Inc.: *See—*
Folson, Henry J.; Hegel, James D.; Hosokawa, William T.; Pester, William B.; and Porter, Irwin C., 3,711,964.
Merino, Dennis H.; and Schlau, Floyd E., 3,712,541.
Staats, William a., 3,712,539.
Staats, William A.; Bosley, Denis V.; Cook, John S.; and Yamasaki, Toshio, 3,712,615.
Starr, Stanley R.; and Edmisson, Russell C., 3,712,538.
Summerfield, William F.; and Nuttall, Fleet E., 3,711,988.
Yamasaki, Toshio; Cook, John S.; and Staats, William A., 3,712,540.

Matthews, John H.: *See—*
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Matusik, Frank J.: *See—*
Fitzgerald, J. Vincent; Matusik, Frank J.; and Oppliger, Hans R., 3,712,117.

Mauck, Michael S., to Tektronix, Inc. Cathode ray tube for producing variable sized displays. 3,712,998, Cl. 315-17.000.

Maurelli, Manlio: *See—*
Morane, Bruno P.; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, 3,712,501.

Mauvernay, Roland Yves; Busch, Norbert; Simond, Jacques; and Moleyre, Jacques, to S.A. Centre Europeen De Recherches Mauvernay C.E.R.M. Butyl-piperazine derivatives. 3,712,893, Cl. 260-268.0ph.

Maw, Philip Arthur: *See—*
Preston, Edward George; Williams, Robert Ernest; and Maw, Philip Arthur, 3,712,160.

Maxon, Glenway, Jr.; and Wright, William H. B., III. Method of making toothed racks. 3,711,915, Cl. 29-159.200.

Maxwell, Bryce, to USM Corporation. Feed system. 3,712,783, Cl. 425-381.200.

Maxwell, Marvin S.: *See—*
Keller, George C.; Maxwell, Marvin S.; and Dod, Louis R., 3,713,163.

May, Charles W.: *See—*
Carroll, John J.; Hughey, Calvin A.; and May, Charles W., 3,713,146.

May, Oswald, to Klockner-Humboldt-Deutz Aktiengesellschaft. Tractor cab. 3,712,664, Cl. 296-102.000.

Mayer, Adolf: *See—*
Husweiler, Arnold; Beilstein, Gunter; Mayer, Adolf; and Paris, Nikolaus, 3,712,912.

Mayer, Dietmar; Sasse, Klaus; and Hermann, Gunther, to Farbenfabriken Bayer Aktiengesellschaft. Insecticidally, acaricidally and rodenticidally active 9-sybstituted acridines. 3,712,943, Cl. 424-84.000.

Maynard, James G.; and Brown, George F., to Krispin Engineering Limited. Refrigeration unit. 3,712,078, Cl. 62-448.000.

Mayne, William H.; and Quay, Roy G., to Petty Geophysical Engineering Company. Method of polarity determination of marine hydrophone streamers. 3,713,084, Cl. 340-7.00r.

Mayo, Frank H.: *See—*
Bundrant, Charles O.; Hainebach, Charles R.; and Mayo, Frank H., 3,712,862.

Mayr, Hubert: *See—*
Muller, Walter; Mayr, Hubert; Weinrotter, Ferdinand; Frohner, Walter; Presoly, Elfriede; and Kollisch, Gustav, 3,712,804.

Mazer, Edward. Portable press assembly. 3,711,925, Cl. 29-252.000.

Mc Cabe, Ralph P., to Chandler Evans Inc. Fuel control. 3,712,055, Cl. 60-39.280.

Mc Call, Richard J. Mailing folder. 3,712,531, Cl. 229-40.000.

Mc Kee, James E., to Republic National Bank of Dallas Irving Trust Company, mesne. Powered roller mechanism. 3,712,454, Cl. 198-127.00r.

McAnally, Milton Beasley, to Scovill Manufacturing Company. Tire valve core. 3,712,328, Cl. 137-234.500.

McDonnell Douglas Corporation: *See—*
Harwood, Oliver P., 3,712,481.

McDonnell, Thomas M. Shelf-supported drawer arrangement. 3,712,696, Cl. 312-253.000.

McElroy, John H. Right angular cross-over switch for conveyor track system. 3,712,237, Cl. 104-99.000.

McFarland, Duard E. Suit bag handle. 3,712,525, Cl. 224-45.00t.

McGinley, William L.; and Pearson, Johnnie P. Bun toaster. 3,712,207, Cl. 99-349.000.

McGraw-Edison Company: *See—*
Payet, George L.; and Forg, John H., 3,712,086.

McIntyre, Maurice J.: *See—*
Rennie, David G.; and McIntyre, Maurice J., 3,712,478.

McKenna, Ronald F.: *See—*
Andrysiak, Stanislaw J.; and McKenna, Ronald F., 3,712,063.

McKeown, William L., to Lek-Trol, Inc. Timing control apparatus. 3,712,987, Cl. 307-41.000.

McKernan, Francis Peter, to Kemi Corporation Limited. Manifolding or copying apparatus. 3,712,643, Cl. 282-29.00b.

McKindra, Clayton D.: *See—*
Campagnuolo, Carl J.; McKindra, Clayton D.; Sewell, Clinton J.; Villarroel, Fernando; and Woolston, Lionel L., 3,712,170.

McLaughlin, Veronica H. Skin conditioning apparatus. 3,712,307, Cl. 128-368.000.

McLelland, Jack I.; and Mangels, Theodore F., to Ocean Science and Engineering Inc. Fairing. 3,712,261, Cl. 114-235.00f.

McMullen, John J., Associates, Inc.: *See—*
Pangalila, Frans V. A., 3,712,243.

McMurray, George F.: *See—*
Niel, Adam P., 3,712,509.

McNair, Robert J., to Avco Corporation. Phase slip corrector means and method for synchronization of pseudo-random generating means in multistation networks. 3,713,025, Cl. 325-58.000.

McPherson, Alan Forbes, to Bell Telephone Laboratories, Incorporated. Data processor sequence checking circuitry. 3,713,095, Cl. 340-146.1ab.

McQuisten, Samuel R.: *See—*
Svehla, Paul W.; and McQuisten, Samuel R., 3,712,670.

McRay, Robert D., to Systomation Incorporated. Capacitance measurement by phase-controlled sampling. 3,713,022, Cl. 324-60.00c.

Mead Corporation, The: *See—*
Chapman, James R.; Baker, Charles; and Gentry, Hermond G., 3,712,464.

Meade, Thomas L. Azeotropic removal of water-hydrocarbon alcohol mixtures from press fish cake. 3,712,822, Cl. 99-209.000.

Medicor Muvek: *See—*
Kizakisz, Iliasz; and Horvath, Vilmos, 3,712,409.

Meditz, John A.: *See—*
Tonkowich, William; Meditz, John A.; and Vignola, Paul, 3,713,132.

Medovar, Boris Izrailevich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; and Baglai, Vitaly Mikhailovich, 3,712,365.

Meier, Ernst, to Interstop AG. Sliding gate nozzle for vessels used for pouring metals. 3,712,518, Cl. 222-561.000.

Meiklejohn, I. G., & Company Limited: *See—*
Meiklejohn, Ian Goodhall, 3,711,916.

Meiklejohn, Ian Goodhall, to Meiklejohn, I. G., & Company Limited. Method of making wire-spoked wheels. 3,711,916, Cl. 29-159.020.

Meitinger, Heinz: *See—*
Egger, Joseph; Meitinger, Heinz; and Schwartz, Herbert, 3,712,043.

Mellow, Dale F.: *See—*
Richardson, Jack Y.; and Mellow, Dale F., 3,712,222.

Menoche, Richard K., to United States of America, Navy. Optical ranging system. 3,713,082, Cl. 340-5.00r.

Merino, Dennis H.; and Schlau, Floyd E., to Mattel, Inc. Trough-shaped toy vehicle track. 3,712,541, Cl. 238-10.00e.

Merkt, Hans; and Hannig, Joachim. Sperm transfer method. 3,712,303, Cl. 128-264.000.

Merlin Gerin, Societe Anonyme: *See—*
Charamel, Pierre; and Ligones, Hubert, 3,712,430.

Merrien, Louis: *See—*
Morane, Bruno P.; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, 3,712,501.

Merten, Rudolf: *See—*
Gilch, Heinrich; Bottenbruch, Ludwig; Zecher, Wilfried; and Merten, Rudolf, 3,712,907.

Meschke, Harry H.; and Van Linder, Ronald C., to Winkel Machine Company, Inc. Saw for trimming cast grids. 3,712,164, Cl. 83-390.000.

Mesiah, Raymond N.: *See—*
Berkowitz, Sidney; and Mesiah, Raymond N., 3,712,891.

Meslener, George John, to RCA Corporation. Decoder for delay modulation signals. 3,713,140, Cl. 340-347.0dd.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Kaufmann, Michael, 3,712,546.

Messervey, Clifford Harry, to Borden Company, The. Flat article feeding device, particularly for feeding can covers from and into a stack. 3,712,483, Cl. 214-6.0ba.

Metcalf, Eric; and Dorey, Anthony Howard, to Solarton Electronic Group Limited, The. Analog-to-digital converter utilizing different feedback effects to obtain accuracy and resolution. 3,713,023, Cl. 324-99.00d.

Metcalf, Joseph R.: *See—*
Fryrear, William A., Jr.; and Metcalf, Joseph R., 3,712,381.

Meteor Research Limited: *See—*
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Meunier, Alfred C.; and Crounse, Nathan N., to Sterling Drug Inc. Benzoxazolylstilbazole fluorescent whitening agent. 3,712,982, Cl. 260-240.00d.

Meyer, Alfred Lake, to Anetsberger Brothers, Inc. Pastry product production system. 3,712,165, Cl. 83-289.000.

Meyer, Joachim; and Pfeffer, Josef, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Reinforced-concrete pressure vessel with lining. 3,712,012, Cl. 52-249.000.

Meyer, Ludwig: *See—*
Von Conrad, Eugene; Rosner, Kurt; and Meyer, Ludwig, 3,712,550.

Meyer, Walter E., to Koehring Company. Load simulation system. 3,712,125, Cl. 73-90.000.

Meyers, Robert E., to Bendix Corporation, The. Shuttle valve for hydraulic brake booster with emergency fluid supply. 3,712,176, Cl. 91-6.000.

Mez, Georg. Flange connection for air conditioning ducts. 3,712,650, Cl. 285-405.000.

Michaelis, Paul Charles: *See—*
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Middleton, William J., to Du Pont de Nemours, E. I., and Company. Tetrakis(polyfluoromethyl)-4-oxazolidinones. 3,712,902, Cl. 260-307.00a.

Middleton, William J., to Du Pont de Nemours, E. I., and Company. 1-Perfluoroalkyl-1,2,2-triphenylethylenes. 3,712,929, Cl. 260-612.00r.

Midland-Ross Corporation: *See—*
Floehr, Walter L., 3,712,248.

Mielke, Clarence Harold, Jr. Apparatus and method for measuring hemostatic properties of platelets. 3,712,293, Cl. 128-2.00g.

Miles, Donald E., to Stansteel Corporation. Rotary apparatus for treating colemanite ore. 3,712,598, Cl. 263-32.00r.

Miller, Carlton S., to PhotoMetrics, Inc. Method and apparatus for optically scanning specimens and producing graphic records therefrom. 3,712,955, Cl. 178-6.60r.

Miller, Cecil John. Alarm system utilizing a digital radio link. 3,713,125, Cl. 340-224.00r.

Miller, Darwin A., to Lofaso, Gerald F. Pipe testing apparatus. 3,712,115, Cl. 73-49.100.

Miller, Eric; and Miller, Robert Eric, to Miller, R. E., Pty., Limited. Base mounting. 3,712,571, Cl. 248-183.000.

Miller, Herman, Inc.: *See—*
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Propst, Robert L.; and Kelley, James O., 3,712,698.

Miller, Meryl E., to Datanetics Corporation. Method of making packages. 3,712,840, Cl. 156-66.000.

Miller, R. E., Pty., Limited: *See—*
Miller, Eric; and Miller, Robert Eric, 3,712,571.

Miller, Robert Eric: *See—*
Miller, Eric; and Miller, Robert Eric, 3,712,571.

Miller, Terry G. Push-off device for hand truck. 3,712,496, Cl. 214-511.000.
Miller, Wayne F.: *See—*
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Milwaukee Electric Tool Corporation: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
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Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
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Mizuno, Katsumi: *See—*
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Mobil Oil Corporation: *See—*
Rosinski, Edward J. Ros; and Smith, Fritz A., 3,712,861.
Moesta, Donald L. Fluid flow control valve and linear actuator therefor. 3,712,582, Cl. 251-134.000.
Mogan Construction Company: *See—*
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Moleyre, Jacques: *See—*
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Molins Machine Company Limited: *See—*
Preston, Edward George; Williams, Robert Ernest; and Maw, Philip Arthur, 3,712,160.
Moliterni, Samuel S. Bird feeder. 3,712,267, Cl. 119-18.000.
Monroe, Donald V. Loud speaker cabinet. 3,712,411, Cl. 181-31.00b.
Monsanto Company: *See—*
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Zorowski, Carl F.; and Calfee, John D., 3,711,934.
Monsen, Per Reidar, to Navalco A/S. Arrangement for the determination of liquid levels. 3,712,136, Cl. 73-290.000.
Montreal Envelope Inc.: *See—*
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Moore Associates: *See—*
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Moore Busines' Forms, Inc.: *See—*
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Moore, Joseph B.: *See—*
Athey, Roy L.; and Moore, Joseph B., 3,711,936.
Moore, Joseph L., to Moore Associates. Litter retrieving device. 3,712,660, Cl. 294-61.000.
Morane, Bruno P.; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, to L'Oreal. Pressure-responsive safety device for aerosol dispenser and containers equipped therewith. 3,712,501, Cl. 220-85.00r.
Moretti, Alberto; and Feroli, Settimio, to Italspier S.p.A. Railway car wite elastic side walls. 3,712,251, Cl. 105-409.000.
Morgan, Huw C.: *See—*
Chanzit, Lawrence; Green, Herbert; and Morgan, Huw C., 3,713,147.
Mori, Kazuo: *See—*
Inaba, Shiegeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; and Yamamoto, Hisao, 3,712,892.
Morimoto, Kazuhisa: *See—*
Murakami, Yoshinobu; Hasegawa, Yo; and Morimoto, Kazuhisa, 3,712,811.
Morrison Products, Inc.: *See—*
Baker, Harold L., 3,711,914.
Morse, William F.: *See—*
Reid, Edward A., Jr.; and Morse, William F., 3,712,289.
Morta, Katsuhiko, to Kabushiki Kaisha Daini Seikosha. Cam wheel mechanism for watches. 3,712,036, Cl. 58-76.000.
Moskowitz, Arthur; MacInnes, William F.; and Sumrall, Calhoun W., to Philco-Ford Corporation. Missile launching apparatus. 3,712,226, Cl. 102-49.300.
Moss, Ellsworth R.: *See—*
Litty, Thomas P.; Moss, Ellsworth R.; and Rice, Edward J., 3,713,006.
Motorola, Inc.: *See—*
Butler, Thomas A.; and Pflugfelder, Reinhold G., 3,713,145.
Lostumon, Arthur J., 3,713,057.
Nation, Melvin S., 3,712,604.
Wagner, James A., 3,713,014.
Mott, George E.; and Loggins, John T., to Texaco Inc. Marine terminal mooring. 3,712,260, Cl. 114-230.000.
Mott, John L. Trouser-suspender connecting trolley means for toilet convenience. 3,711,867, Cl. 2-230.000.
Motz, Carl H.; and Anthony, Russell W., to Lear Siegler, Inc. Gear rolling machine. 3,712,094, Cl. 72-21.000.
Motz, Kaye L.; and Friend, John, to Continental Oil Company. Process for the production of trialkyl aluminum compounds. 3,712,923, Cl. 260-448.00a.
Mowbray, Dorian Farrar, to C.A.V. Limited. Liquid fuel injection pumping apparatus. 3,712,761, Cl. 417-462.000.
MTS Systems Corporation: *See—*
Petersen, Niel R., 3,712,127.
Muenchhausen, Meinolf; and Weber, Ekke, to Siemens Aktiengesellschaft. Method and apparatus for determining and storing the contour course of a written symbol scanned column by column. 3,713,098, Cl. 340-146.3ac.
Muhle, Jochen: *See—*
Brauer, Heinz; and Muhle, Jochen, 3,711,956.
Muhlegger, Klaus: *See—*
Weimann, Gunter; Haid, Erich; Muhlegger, Klaus; Bergmeyer, Hans Ulrich; Dietmann, Karl; Michal, Gerhard; and Nelboeck-Hochstetter, Michael, 3,712,885.
Mullen, Charles K.: *See—*
Branen, Kenneth E.; Castle, George K.; and Mullen, Charles K., 3,712,566.
Muller, Hans. Filter device. 3,712,471, Cl. 210-107.000.
Muller, Johann; and Gschwendtner, Leonhard, to Muller, Katharina, legal representative and hei of said Johann Muller. Machine tool with inclined adjustable carriage in an inclined guide arranged on the column of the machine tool. 3,712,175, Cl. 90-16.000.
Muller, John T. Method and apparatus for measuring human reaction. 3,712,294, Cl. 128-2.00n.
Muller, Katharina, legal representative and hei of said Johann Muller: *See—*
Muller, Johann; and Gschwendtner, Leonhard, 3,712,175.
Muller, Walter; Mayr, Hubert; Weinrotter, Ferdinand; Frohner, Walter; Presoly, Elfriede; and Kollisch, Gustav, to Osterreichische Stickstoffwerke Aktiengesellschaft. Composition for regulating the growth and metabolism of plants. 3,712,804, Cl. 71-113.000.
Multifastener Corporation: *See—*
Laddouceur, Harold A.; and Matthews, John H., 3,711,931.
Munch, Otto R., to Johnson Service Company. Fluidic accelerometer. 3,712,324, Cl. 137-81.500.
Muniz, Raymond, to Compagnie Generale de Geophysique. Method of and apparatus for creating a shock wave beneath the surface of a body of water. 3,712,408, Cl. 181-.50h.
Munson, Robert E.; and Krutsinger, Jack K., to Ball Brothers Research Corporation. Single slot cavity antenna assembly. 3,713,162, Cl. 343-755.000.
Munson, Robert E.; Krutsinger, Jack K.; and Polson, Jerry H., to Ball Brothers Research Corporation. Flush mounted antenna and receiver tank circuit assembly. 3,713,166, Cl. 343-792.000.
Murakami, Yoshinobu; Hasegawa, Yo; and Morimoto, Kazuhisa, to Matsushita Electric Industrial Company Limited. Electrophotographic material. 3,712,811, Cl. 96-1.600.
Murcott, Andrew James, to Hobson, H. M., Limited. Ball screw jack. 3,712,148, Cl. 74-424.80r.
Murphree, Francis J., to United States of America, Navy. Generation of dopplerized, aspect dependent, highlighted simulated echoes. 3,713,081, Cl. 340-3.00e.
Murray, Myles N.; and Beaver, Dale M., to Industrial Electronic Rubber Company. Solenoid valve plunger. 3,712,579, Cl. 251-38.000.
Mursinna, Richard C.: *See—*
Martindale, David L.; Dale, Alan M.; Mursinna, Richard C.; and Rewerts, Gene R., 3,712,583.
Musschoot, Albert; and Kraus, Richard B., to General Kinematics Corporation. Vibratory conveyor. 3,712,459, Cl. 198-220.00a.
Mycom Corporation: *See—*
Hunnicutt, Jack B.; Plumly, George W.; and Radford, Troy R., 3,711,963.
Myers, Clyde B., to Diamond Shamrock Corporation. Highly siliceous alkali metal silicates. 3,712,941, Cl. 423-332.000.
Nadherny, Russell J.: *See—*
Ford, James W.; and Nadherny, Russell J., 3,711,948.
Naganuma, Hisao: *See—*
Hara, Atsushi; Naganuma, Hisao; and Takai, Akio, 3,712,644.
Nagao, Taku: *See—*
Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshi; Kawanishi, Masazumi; Sato, Masanori; and Nagao, Taku, 3,712,895.
Nagy, Ernest J.; and Shaver, William R., to Pullman Incorporated. Flexible railway hopper closure operating mechanism. 3,712,249, Cl. 105-282.00r.
Nagy, John, Jr., to Weston Instruments, Inc. Analog-to-digital converters. 3,713,136, Cl. 340-347.0nt.
Naito, Shun-Ichi. Derivatives of 4-(aminoethane-sulfonylamino)-antipyrine. 3,712,906, Cl. 260-294.80f.
Nankivell, Erby Roy, to Ralide, Inc. Integral saddle tree and ground seat. 3,712,024, Cl. 54-44.000.
Naphtachimie: *See—*
Bernard, Jean C.; and Pascal, Pierre J., 3,712,828.

Napor, Carl A.; and Krumm, Charles G., to Kahle Engineering Company. Film scroll winding machine. 3,712,553, Cl. 242-56.00r.

Narozny, Ronald S., to Thomas & Betts Corporation. Electrical connector. 3,713,073, Cl. 339-17.00f.

Nash, Dudley O., to General Electric Company. Cooled augmentor liner. 3,712,062, Cl. 60-261.000.

Nash Engineering Company: *See—*
Shearwood, Raymond S., 3,712,764.

Nathans, Robert L. RF and sonic systems for preventing shoplifting of goods and unauthorized removal of capsules affixed thereto for protecting goods. 3,713,133, Cl. 340-280.000.

Nathansohn, Giangiacomo; Aresi, Vanna; and Winters, Giorgio, to Gruppo Lepetit S.p.A. Triazaspirodecanedithiones. 3,712,897, Cl. 260-293.660.

Nation, Melvin S., to Motorola, Inc. Mechanical spring constant load device. 3,712,604, Cl. 26-161.000.

National Automatic Tool Company, Incorporated: *See—*
Sherer, Kenneth E., 3,712,777.

National Can Corporation: *See—*
Zundel, Arthur P., 3,712,503.

National Cash Register Company, The: *See—*
Barsamian, Harut, 3,713,107.
Girard, Donald J., 3,713,138.
Landis, Donald E., 3,712,210.

National Metal and Refining Company, Inc.: *See—*
Fitzgerald, J. Vincent; Matusik, Frank J.; and Oppliger, Hans R., 3,712,117.

National Research Development Corporation: *See—*
Snowdon, Charles; and Redhead, Robert Gonne, 3,712,298.

Navalco A/S: *See—*
Monsen, Per Reidar, 3,712,136.

Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverhei: *See—*
Verkiak, Arie; and Funcke, Cornelis Leendert, 3,712,097.

Nelboeck-Hochstetter, Michael: *See—*
Weimann, Gunter; Haid, Erich; Muhlegger, Klaus; Bergmeyer, Hans Ulrich; Dietmann, Karl; Michal, Gerhard; and Nelboeck-Hochstetter, Michael, 3,712,885.

Nelson, Charles E., to Environmental Control Systems, Inc. Gas or oil fired heat exchanger for forced air heating unit. 3,712,286, Cl. 126-110.00b.

Nelson, Nels, to United States Gypsum Company. Integral stud and bracket standard for use in a wall construction. 3,712,015, Cl. 52-729.000.

Nelson, Robert W., to AVM Corporation. Linen inspection table. 3,712,744, Cl. 356-238.000.

Nerwin, Hubert, to Eastman Kodak Company. Self-processing camera and film pack for use therewith. 3,712,198, Cl. 95-13.000.

Neudecker, Karl: *See—*
Winkler, Alfred; Winkler, Friedrich; Neudecker, Karl; and Zanner, Johann, Jr., 3,712,720.

Neudecker, Karl, to Agfa-Gevaert Aktiengesellschaft. Motion picture projector with carriage for sets of film-containing cassettes. 3,712,722, Cl. 352-123.000.

Neumann, Wolfram: *See—*
Ranz, Erwin; Von Rintelen, Harald; Schutz, Heinz-Dieter; and Neumann, Wolfram, 3,712,814.

New, Ronald D.: *See—*
Koff, Irwin; New, Ronald D.; and Holladay, Samuel P., 3,712,169.

Newdigate, Charles Barrington, to Cathcart-James, Ivan Henry. Rear view mirror with air vane ration means. 3,712,703, Cl. 350-62.000.

Nicholson, Myron M., to Ford Motor Company. Spare tire extractor assist device. 3,712,586, Cl. 254-1.000.

Nickl, Josef: *See—*
Kruger, Gerd; Zipp, Otmar; Keck, Johannes; Nickl, Josef; Machleidt, Hans; Ohnacker, Gerhard; Engelhorn, Robert; and Puschmann, Sigfrid, 3,712,924.

Niederberger, Richard P.: *See—*
Doe, James B.; Niederberger, Richard P.; Curcio, Michael C.; and Forker, Michael H., 3,712,834.

Niel, Adam P., to McMurray, George F. Drapery pinhook tool with movable magazine. 3,712,509, Cl. 221-197.000.

Nielsen, Edwin; and Carella, Vincent, to Ideal Toy Corporation. Chassis assembly. 3,711,989, Cl. 46-201.000.

Nikowitz, Johann: *See—*
Hillinger, Bruno; Nikowitz, Johann; and Schwarz, Michael, 3,712,002.

Nimylowycz, Osyp, to United States of America, Army. Ammunition. 3,712,225, Cl. 102-38.000.

Ninet, Leon: *See—*
Mancy, Denise; Ninet, Leon; and Preud'Homme, Jean, 3,712,945.

Nippon Electric Company, Limited: *See—*
Sakamoto, Kazuo; and Tamura, Ryoji, 3,713,041.
Usuda, Shogo; Hamazato, Kazuo; Uehara, Kiyoshi; and Uchida, Hisashi, 3,713,045.

Nippon Kogaku K.K.: *See—*
Ono, Shigeo; and Hamaguchi, Ichiro, 3,712,192.
Sato, Akira, 3,712,704.

Nippon Kokan Kabushiki Kaisha: *See—*
Hara, Atsushi; Naganuma, Hisao; and Takai, Akio, 3,712,644.
Kimuro, Tadao; and Ataniya, Takeshi, 3,712,826.
Ozawa, Naosuke; Kawakami, Takaaki; and Watabe, Minoru, 3,712,529.

Nippon Telegraph & Telephone Public Corporation: *See—*
Usuda, Shogo; Hamazato, Kazuo; Uehara, Kiyoshi; and Uchida, Hisashi, 3,713,045.

Nittel, Fritz; Ohlschlager, Hans; and Schranz, Karl-Wilhelm, to Agfa-Gevaert Aktiengesellschaft. Photographic stabilising or fixing bath. 3,712,818, Cl. 96-61.000.

Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic exposure controls for cameras. 3,712,190, Cl. 95-10.0ct.

Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical circuitry for controlling camera shutters. 3,712,191, Cl. 95-10.0ct.

Nolt, Edwin B.; Eby, Richard R.; and Eberly, Harry G., to Sperry Rand Corporation. Knotter mechanism having a twine guide cooperating with a bill hook. 3,712,654, Cl. 289-2.000.

Noorily, Peter, to Thomas & Betts Corporation. Strap tightening and cutting tool. 3,712,346, Cl. 140-123.600.

Norba Aktiebolag: *See—*
Lindeborg, Georg, 3,712,494.

Norco, Inc.: *See—*
Lehmann, Kenneth G., 3,712,653.

Nordgren, Robert, to General Mills, Inc. Carboxyalkyl ethers of galactomannan gums. 3,712,883, Cl. 260-209.000.

Norr, David A.; and Norr, Robert C., to Norr Engineering-Manufacturing Corporation. System and method of wrapping. 3,712,020, Cl. 53-30.000.

Norr Engineering-Manufacturing Corporation: *See—*
Norr, David A.; and Norr, Robert C., 3,712,020.

Norr, Robert C.: *See—*
Norr, David A.; and Norr, Robert C., 3,712,020.

North American Aviation, Inc.: *See—*
Kuhn, Richard B., 3,712,957.

North American Rockwell Corporation: *See—*
August, Henry, 3,713,157.
Baumgras, George R., 3,711,917.

Northern Electric Company, Limited: *See—*
Debortoli, George; and Lukas, Helmut Hans, 3,711,921.
Elliott, Gilbert Leslie, 3,713,054.
Wong, Cho Lun; Jones, Glenson Trevelyn; and Crawford, Roland Francis, 3,713,046.

Northrop Carolina, Inc., mesne: *See—*
Cooper, Fredric M., 3,712,058.

Norton, Bruce, to Kollmorgen Corporation. Reflector arrangement for attenuating selected components of spectral radiation. 3,712,980, Cl. 240-47.000.

Norton, Roland H.: *See—*
United States of America, National Aeronautics and Space Administration, 3,712,121.

Notman, Robert J.: *See—*
Carder, Victor H.; and Notman, Robert J., 3,712,495.

Notvest, Kenneth R.: *See—*
Keledy, Francis C.; and Notvest, Kenneth R., 3,713,127.

Novar Electronics Corporation: *See—*
Stettner, Joseph C., 3,713,126.

Nudenberg, Walter; Harvey, Merlin P.; and Mann, James U., to Uniroyal, Inc. O,O,S-triesters of phosphorodithioic acid as accelerators in the sulfur vulcanization of EPDM rubbers. 3,712,878, Cl. 260-79.50b.

Nuttall, Fleet E.: *See—*
Summerfield, William F.; and Nuttall, Fleet E., 3,711,988.

N.V. "COQ": *See—*
Boersma, Rintje; and Irik, Gijsbert Waldemar, 3,712,953.

N.V. Hollandse Signaalapparaten: *See—*
Van Popta, Yftinus Frederik, 3,713,153.

N.V. Industrieele Handelscombinatie Holland: *See—*
Van Heijst, Willem Jan, 3,711,968.

N.V. tot Aanneming van Werken voorheen H. J.: *See—*
van Weele, Abraham Francois, 3,712,067.

Nye, William M.; and Jones, Stanley W., to Lanier Electronic Laboratory, Inc. Endless tape recorder-transcriber dictation system control. 3,712,961, Cl. 179-100.1dr.

Obligado, Alvaro, to Avco Corporation. High speed centrifugal air-oil separator. 3,712,032, Cl. 55-409.000.

O'Brien, John A., to Itek Corporation. Document reproduction apparatus. 3,712,729, Cl. 355-25.000.

O'Brien, Raymond W. Apparatus for controlling the tension of webs. 3,712,555, Cl. 242-72.000.

Ocean Science and Engineering Inc.: *See—*
McLelland, Jack I.; and Mangels, Theodore F., 3,712,261.

Odier, Marc. Game with polyhedral playing pieces. 3,712,622, Cl. 273-130.00r.

Ogawa, Kinya: *See—*
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,712,886.

Ogawa, Yoshihisa: *See—*
Kiyokawa, Yasumasa; Ogawa, Yoshihisa; Ono, Akira; Fukumasu, Kazuichi; and Sugisaki, Hiroyuki, 3,712,824.

O'Hara, Carl F. Ladder attachment. 3,712,419, Cl. 182-107.000.

Ohlschlager, Hans: *See—*
Nittel, Fritz; Ohlschlager, Hans; and Schranz, Karl-Wilhelm, 3,712,818.

Ohlschlager, Norman. Maze game. 3,712,617, Cl. 273-153.00r.

Ohnacker, Gerhard: *See—*
Kruger, Gerd; Zipp, Otmar; Keck, Johannes; Nickl, Josef; Machleidt, Hans; Ohnacker, Gerhard; Engelhorn, Robert; and Puschmann, Sigfrid, 3,712,924.

Ohtsubo, Hideo: *See—*

Kitani, Hiroshi; Yoshida, Kenichi; Ohtsubo, Hideo; and Kuroda, Masataka, 3,713,052.

Oldham, Herman J.: *See—*
Parris, John L.; and Oldham, Herman J., 3,712,605.

Olin Corporation: *See—*
Peterson, Warren S.; and Tyler, Clarence M., Jr., 3,712,589.
Shapiro, Stanley; Goldman, Alan J.; Tyler, Derek E.; and Lanam, Richard D., 3,712,837.
Tranel, Lester J., 3,712,372.

Oliver, Donald S.; and Zacharias, Jerrold R., to Itek Corporation. Large screen television systems. 3,712,954, Cl. 178-5.4bd.

Olivier, Donald A., to Shell Oil Company. Wire line method and apparatus for cleaning well perforations. 3,712,378, Cl. 166-299.000.

Olney, Frederick D., Jr.; and Crump, Robert O., to Honeywell Information Systems, Inc. Gravity-fed pin insertion device. 3,711,924, Cl. 29-203.00b.

Olsen, Robert W.: *See—*
Hallock, Edward C.; Olsen, Robert W.; and Viehmann, George A., 3,712,003.

Olson, John W., Jr., to Mitchell, John E., Company. Lubricating system for multiple piston compressor units and driven parts thereof. 3,712,759, Cl. 417-269.000.

Olson, Rich: *See—*
Ririe, Max H.; Roland, Murray C.; and Olson, Rich, 3,712,544.

Onda, Yoshiro: *See—*
Koyanagi, Shunichi; Ogawa, Kinya; Onda, Yoshiro; and Yamamoto, Akira, 3,712,886.

Ono, Akira: *See—*
Kiyokawa, Yasumasa; Ogawa, Yoshihisa; Ono, Akira; Fukumasu, Kazuichi; and Sugisaki, Hiroyuki, 3,712,824.

Ono, Shigeo; and Hamaguchi, Ichiro, to Nippon Kogaku K.K. Device for controlling exposure time in a camera. 3,712,192, Cl. 95-10.0ct.

Oppl, Hans: *See—*
Gressenich, Klaus; Oppl, Hans; Walter, Berthold; Weismann, Hans; and Zobl, Hartmut, 3,713,067.

Oppliger, Hans R.: *See—*
Fitzgerald, J. Vincent; Matusik, Frank J.; and Oppliger, Hans R., 3,712,117.

Orenstein & Koppel Aktiengesellschaft: *See—*
Althaus, Ernst, 3,712,398.

Orfei, John B.; and Shapiro, Henry, to American Science & Engineering Inc. Magnetic educational vehicle. 3,711,991, Cl. 46-236.000.

Ornstein, Jacob L., to Texas Instruments, Incorporated. Composite thermostat material. 3,712,799, Cl. 29-195.500.

Ortec, Incorporated: *See—*
Dilworth, Robert H., III, 3,712,859.
Williams, Charles W.; and Gedcke, Dale A., 3,713,031.

Osborn, Jack S. Dust bag quality testing system. 3,712,114, Cl. 73-38.000.

Osterreichische Stickstoffwerke Aktiengesellschaft: *See—*
Muller, Walter; Mayr, Hubert; Weinrotter, Ferdinand; Frohner, Walter; Presoly, Elfriede; and Kollisch, Gustav, 3,712,804.

Ottenheym, Adrian: *See—*
Kurczyk, Heinz-Georg; Wuhrer, Josef; and Ottenheym, Adrian, 3,712,768.

Otto, Carlos F. Holding tank evacuating apparatus for a recreational vehicle. 3,712,331, Cl. 137-355.160.

Otto, Gunter, to Suspa Federungstechnik G.m.b.H. Cylinder and piston arrangement. 3,712,429, Cl. 188-300.000.

Otto, Walter J., to Englesberg, Julius L. Pump for liquids which emit corrosive fumes. 3,712,755, Cl. 415-109.000.

Ovation Instruments, Inc., mesne: *See—*
Rickard, James H., 3,712,951.

Overly, Inc.: *See—*
Overly, Wm. F.; and Pagel, Kenneth J., 3,711,960.

Overly, Wm. F.; and Pagel, Kenneth J., to Overly, Inc. Web dryer. 3,711,960, Cl. 34-156.000.

Owen, Harrold D.; Rosenthal, Wayne O.; and Young, James Douglas, to Gearhart-Owen Industries, Inc. Conduit liner for wellbore and method and apparatus for setting same. 3,712,376, Cl. 166-277.000.

Owen, Joseph R.: *See—*
Driskell, Carl R.; and Owen, Joseph R., 3,713,000.

Owens-Corning Fiberglas Corporation: *See—*
Stapleford, Stuart H., 3,712,832.

Owens-Illinois, Inc.: *See—*
Kozlowski, Tadeusz; and Pemberton, Ernest H., 3,712,183.
Steigelman, Herman A., 3,712,829.

Ozawa, Naosuke; Kawakami, Takaaki; and Watabe, Minoru, to Nippon Kokan Kabushiki Kaisha. Movable welding jig. 3,712,529, Cl. 228-44.000.

Pacesetter Products, Inc.: *See—*
Weinstein, Aaron; and Scourtas, Frank, 3,711,969.

Padgitt, Howard R., to Lilly, Eli, and Company. Illumination of convex surfaces. 3,712,979, Cl. 240-41.35r.

Page, John R., Jr., to Hewlett-Packard Company. Signal frequency controller. 3,713,040, Cl. 331-1.00a.

Page, Richard W. Dental instrument hose clip with selector valve. 3,712,314, Cl. 137-560.000.

Page, Wayne L.: *See—*
Roddy, Joseph T.; and Page, Wayne L., 3,712,438.

Pagel, Kenneth J.: *See—*
Overly, Wm. F.; and Pagel, Kenneth J., 3,711,960.

Pagenkopf, Stanley W. Automatic leak detection and shutoff system. 3,712,327, Cl. 137-78.000.

Pakosh, Peter, to Versatile Manufacturing Ltd. Steering and drive assembly for self-propelled units. 3,712,403, Cl. 180-6.480.

Palama, Roberto. Semi-automatic marksmanship competition pistol for rapid precision firing. 3,711,980, Cl. 42-16.000.

Pampus, Gottfried: *See—*
Schon, Nikolaus; Schnoring, Hildegard; Witte, Josef; and Pampus, Gottfried, 3,712,867.

Pan American Petroleum Corporation: *See—*
Bearden, William G.; and Howard, George C., 3,712,373.

Pangalila, Frans V. A., to McMullen, John J., Associates, Inc. Railway car roll stabilization. 3,712,243, Cl. 105-1.00a.

Pankey, Russell: *See—*
Crimmins, James W.; and Pankey, Russell, 3,713,038.

Paoletti, Charles: *See—*
Morane, Bruno P.; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, 3,712,501.

Papiripari Vallslat: *See—*
Gabor, Zoltan; Szanto, Jozsef; and Martini, Gyorgy, 3,712,462.

Parent, Ronald Joseph. Method and device for handling motor vehicle keys. 3,712,091, Cl. 70-63.000.

Paris, Nikolaus: *See—*
Husweiler, Arnold; Beilstein, Gunter; Mayer, Adolf; and Paris, Nikolaus, 3,712,912.

Parisot, Clovis: *See—*
Basier, Robert; and Parisot, Clovis, 3,712,502.

Parker, Henry R., to Improved Machinery Inc. Molding machine having yieldably restrained clamping force applying element. 3,712,774, Cl. 425-154.000.

Parker Pen Company, The: *See—*
Rackow, Martin L., 3,712,093.

Parks, John H., to Caterpillar Tractor Company. Sleeve metering collar adjusting lever. 3,712,763, Cl. 417-499.000.

Parks, William L., III.: *See—*
Cardullo, Mario W.; and Parks, William L., III., 3,713,148.

Parlagreco, Peter. Hair wave and curling device. 3,712,310, Cl. 132-40.000.

Parlow, John, to Emerson Electric Co. Solenoid combined shading coil and return spring. 3,712,581, Cl. 251-129.000.

Parr, Bryan Reginald: *See—*
Smith, Michael John Stapley; Wilson, John Henry; and Parr, Bryan Reginald, 3,712,075.

Parrent, Russell, to Airtex Product Div., United Industrial Syndicate. Electric pump commutator brush holder construction. 3,711,907, Cl. 310-247.000.

Parris, John L.; and Oldham, Herman J., to Carborundum Company, The. Apparatus for clamping and discharging workpieces. 3,712,605, Cl. 269-14.000.

Pasbrig, Max. Detachable connection for electrical contacts of a plug and socket. 3,713,074, Cl. 339-41.000.

Pascal, Pierre J.: *See—*
Bernard, Jean C.; and Pascal, Pierre J., 3,712,828.

Pasternack, George, to Continental Can Company, Inc. Photopolymerizable compositions useful as a printing ink vehicle. 3,712,871, Cl. 260-22.0xa.

Patel, Babu B.: *See—*
Chadha, Desh D.; Patel, Babu B.; and Pickett, Charles G., 3,712,141.

Patel, Kalyanji U.; and Maier, John E., to Minnesota Mining and Manufacturing Company. Curable vinylidene fluoride elastomers containing phosphonium curing agents. 3,712,877, Cl. 260-87.700.

Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; and Baglai, Vitaly Mikhailovich. Electroslay process for the production of metal castings. 3,712,365, Cl. 164-52.000.

Paulik, Ference: *See—*
Paulik, Jeno; and Paulik, Ference, 3,712,110.

Paulik, Jeno; and Paulik, Ference, to Mag-ar Optikai Muvek. Sample holder for selective thermoanalytical tests. 3,712,110, Cl. 73-15.00b.

Payet, George L.; and Forg, John H., to McGraw-Edison Company. Apparatus for producing a durable press in garments containing cellulose or cellulosic derivative. 3,712,086, Cl. 68-5.00c.

Payne, David H.: *See—*
Yates, John; and Payne, David H., 3,712,805.

Pearson, Johnnie L.: *See—*
Bruner, Weston G.; Pearson, Johnnie L.; Reeder, George C., Jr.; Gaheen, Alfred F., Jr.; Green, Elberson D.; and Hughes, Robert B., 3,713,149.

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Pelizzoni, Winton J.; Baumbaugh, Charles R.; and Calliss, William A., to Mack Trucks, Inc. Engine lubrication system. 3,712,420, Cl. 184-103.00r.

Pellerin, Daniel: *See—*
Siard, Michel; and Pellerin, Daniel, 3,712,784.

Pelzer, Hans, to Krupp, Fried., Gesellschaft mit beschrankter Haftung. Long-distance belt conveyor and method of operating same. 3,712,457, Cl. 198-208.000.

Pemberton, Ernest H.: *See—*
Kozlowski, Tadeusz; and Pemberton, Ernest H., 3,712,183.

Penniman, Robert, to Barreca Products Co.; subsidiary of Shelburne Industries, Inc. Ski-mounting rack means. 3,712,522, Cl. 224-29.00r.

Penwell, James T. Metal lined metal pump barrel. 3,712,182, Cl. 92-169.000.

Persons-Majestic Mfg. Company: *See—*
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Pester, William B.: *See—*
Folson, Henry J.; Hegel, James D.; Hosokawa, William T.; Pester, William B.; and Porter, Irwin C., 3,711,964.
Peter, Richard: *See—*
Angliker, Hans-Joerg; and Peter, Richard, 3,712,881.
Peters, Rudolph W. Pneumatic hand tool having automatic collet and brake. 3,712,386, Cl. 173-46.000.
Petersen, Harro, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of N-polyalkoxymethylamides. 3,712,926, Cl. 260-561.00k.
Petersen, Niel R., to MTS Systems Corporation. Drive train test stand. 3,712,127, Cl. 73-118.000.
Peterson, John E. Container with removal side panels. 3,712,504, Cl. 220-84.000.
Peterson, Warren S.; and Tyler, Clarence M., Jr., to Olin Corporation. Porous or foamed metal energy absorption device. 3,712,589, Cl. 256-13.100.
Petrol Injection Limited: *See—*
Jackson, Harold Ernest, 3,712,275.
Petroshanoff, George J., to Tridair Industries. Self-retained bolt. 3,712,356, Cl. 151-6.000.
Petty Geophysical Engineering Company: *See—*
Mayne, William H.; and Quay, Roy G., 3,713,084.
Petzsch, Lothar; and Harnau, Hans-Dieter, to Rheinmetall GmbH. Safety-percussion cap responsive to rotation. 3,712,231, Cl. 102-79.000.
Pfaff Industriemaschinen GmbH, Firma: *See—*
Striegler, Werner; and Angele, Eugen, 3,712,256.
Pfalzstahlbau G.m.b.H.: *See—*
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Pfarrwaller, Erwin, to Sulzer Brothers Limited. Yarn clamping mechanism. 3,712,345, Cl. 139-125.000.
Pfeffer, Josef: *See—*
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Pfeilsticker, Lee J., to Tonka Corporation. Cylinder mounting for toy dump truck. 3,711,990, Cl. 46-214.000.
Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,712,913.
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Marino, Joseph J.; and Demaison, Raymond J., 3,712,681.
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Moskowitz, Arthur; MacInnes, William F.; and Sumrall, Calhoun W., 3,712,226.
Philip, Thoni V., to Carpenter Technology Corporation. Deep hardening steel. 3,712,808, Cl. 75-125.000.
Philipp, Gabriel; and Braun, Stephan. Universal joint for coupling a plurality of shafts. 3,712,081, Cl. 64-17.00r.
Phillips, Alan R.: *See—*
Jope, Bruce T.; and Phillips, Alan R., 3,712,780.
Phillips, Edward H.; and Underwood, Raymond D., to Programmed Power, Inc. Voltage controlled inverter circuit for variable supply voltages and loads. 3,713,013, Cl. 321-45.00r.
Phillips Petroleum Company: *See—*
Billings, William G., 3,712,894.
Collie, Stafford D., 3,712,519.
Flink, Frank B., 3,712,184.
Phipps, Charles M.; and Boucher, Raymond R., to United Aircraft Corporation. Apparatus for making directionally solidified castings. 3,712,368, Cl. 164-336.000.
Phone-Poulence S.A.: *See—*
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PhotoMetrics, Inc.: *See—*
Miller, Carlton S., 3,712,955.
Piatti, Sanzio Pio Vincenzo. Valve actuating arrangement for internal combustion engines. 3,712,277, Cl. 123-90.220.
Piccone, Dante E.; and Somos, Istvan, to General Electric Company. Thyristor turn-on circuit. 3,713,101, Cl. 340-147.00r.
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Pickles, Joseph, to Ferro Manufacturing Corporation. Six-way vehicle seat adjuster. 3,712,573, Cl. 248-394.000.
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Pieper, Donald L., to General Electric Company. Bilateral servo controlled manipulator. 3,712,180, Cl. 91-363.000.
Piller, Richard G., to Reynolds Metals Company. Method for controlling a reduction cell. 3,712,857, Cl. 204-67.000.
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Isberg, Per Gustaf; Pind, Christen Willemoes; and Sundqvist, Cnut Herbert, 3,712,851.
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Poliak, John M.; and Lopez, Juan M., to Leviton Manufacturing Co., Inc. Mounting strap for grounding electrical devices. 3,713,071, Cl. 339-14.00r.
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Polson, Jerry H.: *See—*
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Poppinger, Herbert; and Liska, Manfred, to Siemens Aktiengesellschaft. System for regulating the speed of an axially driven winder drive. 3,713,009, Cl. 318-6.000.
Porsche, Dr.-Ing. H.c.F., K.G., Firma: *See—*
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Porter, Laurence W., to Vaughan & Bushnell Mfg. Co. Bricklayers hammer head having wear-resistant chipping end surfaces. 3,712,284, Cl. 125-40.000.
Porter, Max L.; and Ekberg, Carl E., to Iowa State University Research Foundation. Prestressed metal and concrete composite structure. 3,712,010, Cl. 52-223.000.
Posakony, Gerald J.: *See—*
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Post Office, The: *See—*
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Pothier, Robert G. Surface and subsurface detection device. 3,713,156, Cl. 343-17.000.
Potin, Marcel, to Societe Financiere Francaise de Licences et Brevets. Process and device for making slide fasteners. 3,711,930, Cl. 29-408.000.
Poupin, Raymond: *See—*
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Preston, Edward George; Williams, Robert Ernest; and Maw, Philip Arthur, to Molins Machine Company Limited. Trimmers for cigarette making machines. 3,712,160, Cl. 83-4.000.
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Preud'Homme, Jean: *See—*
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Price, Frank C., Jr., to Ultrasystems, Inc., mesne. Fog dispersal system. 3,712,542, Cl. 239-2.00r.
Priefert, Erwin E. Irrigation pipe trailer. 3,712,493, Cl. 214-515.000.
Priest, John D. Exhaust depurator. 3,712,030, Cl. 55-213.000.
Prochaska, Frank O.: *See—*
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Propst, Robert L.; and Kelley, James O., to Miller, Herman, Inc. Structural support system for drawers and the like. 3,712,698, Cl. 312-350.000.
Pullman Incorporated: *See—*
Nagy, Ernest J.; and Shaver, William R., 3,712,249.
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Puschmann, Sigfrid: *See—*
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Ranz, Erwin; Von Rintelen, Harald; Schutz, Heinz-Dieter; and Neumann, Wolfram, to Agfa-Gevaert Aktiengesellschaft. Photographic material. 3,712,814, Cl. 96-36.000.

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Genese, Joseph N.; Raprza, Edward J.; Galanaugh, Charles F.; Kennard, Harry M.; Chevalaz, Roger A.; and Smith, John A., 3,712,535.

Rasmussen, Niels P. Beach protection system. 3,712,069, Cl. 61-49.000.

Rasmussen, Ole-Bendt. Laminated lamellar laminate. 3,712,847, Cl. 161-55.000.

Ratten, Antonius G.; and Van Brederode, Jan H., to Stichting Ontwikkeling Verpakkingsmethoden in de Zuivelindustrie. Sealing of foam plastic sheets. 3,712,844, Cl. 161-38.000.

Rausch, John J.: *See—*
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Reed, Jack P. Portable bacteriological incubator. 3,712,268, Cl. 119-37.000.

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Refrigiwear, Inc.: *See—*
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Regelson, Ephraim; Sumnicht, Howard I.; and Crecelius, John D., to United States of America, Navy. Method for suppression of heat radiation. 3,712,054, Cl. 60-39.020.

Reibel, Robert W.: *See—*
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Reid, Edward A., Jr.; and Morse, William F., to Columbia Gas System Service Corporation. Deep fat fryer. 3,712,289, Cl. 126-391.000.

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Renault, Jacques R. Chord slide rule for musical instruments. 3,712,167, Cl. 84-485.000.

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Renhurst Industries Proprietary Limited: *See—*
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Rennie, David G.; and McIntyre, Maurice J., to Skogit Corporation. Log yarding system and method. 3,712,478, Cl. 212-89.000.

Republic National Bank of Dallas Irving Trust Company, mesne: *See—*
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Restelli, Ronald E., to Textron Inc. Welded retainer for an antifriction bearing. 3,712,692, Cl. 308-217.000.

Rethorst, Scott C. Slotted diffuser system for reducing aircraft induced drag. 3,712,564, Cl. 244-41.000.

Revert, Philippe, to Commissariat a l'Energie Atomique. Apparatus for the accurate measurement of dimensions of objects, especially the diameter of cylindrical objects. 3,712,741, Cl. 356-160.000.

Reves, E. T., to Dart Industries, Inc. Calibrating medium displacement flow rate calibrator. 3,712,135, Cl. 73-219.000.

Rewerts, Gene R.: *See—*
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Rex Chainbelt Inc.: *See—*
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Rey, Hans-Georg: *See—*
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Reynolds, Charles Edward, to AMP Incorporated. Coaxial connector controlled characteristic impedance process. 3,711,942, Cl. 29-593.000.

Reynolds Metals Company: *See—*
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Rheinische Kalksteinwerke GmbH: *See—*
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Rheinmetall GmbH: *See—*
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Rhoades, Vaughan W., to Cities Service Oil Company. Simplified well-bore pressure testing apparatus. 3,712,129, Cl. 73-151.000.

Rhodes, Alex; and Wright, Allen C., to Ford Motor Company. Release valve for a compressed gas container. 3,712,319, Cl. 137-68.000.

Rhomega Systems, Inc.: *See—*
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Rhone-Poulenc S.A.: *See—*
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Rhone-Poulence S.A.: *See—*
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Rice, Edward J.: *See—*
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Rice, Elmore W., III, to General Aviation Electronics, Inc. Aircraft proximity warning indicator. 3,713,161, Cl. 343-112.0ca.

Rice, Willard W., Jr., to Foxboro Company, The. Analog electronic multiplier, divider and square rooter using pulse height and pulse-width modulation. 3,712,977, Cl. 235-195.000.

Richards, Fred F., Sr. Lock for telephone instrument. 3,712,964, Cl. 179-189.00r.

Richards Manufacturing Company, Inc.: *See—*
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Richardson, Jack Y.; and Mellow, Dale F., to Brunswick Corporation. Pyrotechnic fuse. 3,712,222, Cl. 102-27.00r.

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Ririe, Max H.; Roland, Murray C.; and Olson, Rich, to Lockwood Corporation. Alignment means for mobile irrigation apparatus. 3,712,544, Cl. 239-177.000.

Risacher, Gerard H., to Westinghouse Electric Corporation. Steam iron. 3,711,972, Cl. 38-77.830.

Risky, Frank A., to GTE Automatic Electric Laboratories Incorporated. Remote contact sensing scanpoint matrix. 3,713,103, Cl. 340-166.00r.

Rist, Michel, to Societe Anonyme Francaise du Ferodo. Clutch plate spring with pivot rings. 3,712,436, Cl. 192-89.00b.

Rittersdorf, Walter; Rey, Hans-Georg; and Rieckmann, Peter, to Boehringer Mannheim G.m.b.H. Diagnostic agent for the detection of nitrite and of nitrite-forming bacteria. 3,712,853, Cl. 195-103.50r.

Robbiati, Dante. Metallic laminate. 3,712,849, Cl. 161-218.000.

Roberts, Evan D. Self-righting instrument cap device. 3,712,749, Cl. 401-202.000.

Robertshaw Controls Company: *See—*
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Rochelle, James M.: *See—*
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Rocket Research Corporation: *See—*
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Rodale Manufacturing Company, Inc.: *See—*
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Roddy, Joseph T.; and Page, Wayne L., to Emerson Electric Co. Centrifugal friction clutch. 3,712,438, Cl. 192-105.0cd.

Roger, Robert. Device for discharging processed or worked lengths of material from a work table. 3,712,609, Cl. 271-74.000.

Rogers, Stanley, to General Dynamics Corporation. Wide-band, high-frequency matrix switch. 3,713,105, Cl. 340-166.00r.

Roggero, Arnaldo: *See—*
Arrighetti, Sergio; Roggero, Arnaldo; Vajna, Eugenio; and Cesca, Sebastiano, 3,712,876.

Rohr, Udo: *See—*
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Rohrer, Kenneth L.; Griswold, Douglas A.; and Davies, David H., to Westinghouse Electric Corporation. Method of manufacturing a display screen. 3,712,815, Cl. 96-36.100.

Roland, Murray C.: *See—*
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Rolfzen, Arthur L., to Polar Manufacturing Company. Vacuum breaker valve for shell-like tanks. 3,712,334, Cl. 137-587.000.

Rollei-Werke Franke & Heidecke: *See—*
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Rollway Bearing Company, Inc.: *See—*
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Romang, Lucien; and Voumard, Francois, to Seitz S.A. Shock absorbing pivot bearing for watches. 3,712,051, Cl. 58-140.00a.

Romanzi, Louis, Jr.: *See—*
Gavagan, James A.; and Romanzi, Louis, Jr., 3,711,904.

Rondeau, John L. Barrel pool apparatus including spring projector. 3,712,626, Cl. 273-101.000.

Ronsivalli, Louis J.; and Learson, Robert J., to United States of America, Interior. Production of fisheries products. 3,712,821, Cl. 99-111.000.

Ronson Corporation: *See—*
Mackness, Frederich Vincent Summersford; Cheetham, John Norman; and Watson, Victor Jack, 3,712,168.

Root, Lawrence E.; Derner, William J.; and Stewart, Harold E., to Rollway Bearing Company, Inc. Miltiple stage thrust bearing. 3,712,693, Cl. 308-231.000.

Roscoe, William A. Method and apparatus for grading double reeds for musical instruments. 3,712,113, Cl. 73-37.000.

Rosen, Erhardt W.: *See—*
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Rosenthal, Wayne O.: *See—*
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Rosner, Kurt: *See—*
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Ross, Dieter; and Kiemle, Horst, to Siemens Aktiengesellschaft. Production of semiconductor modules by a photo-resist technique with holographic projection of etching patterns. 3,712,813, Cl. 96-27.00h.

Ross, Edward Charles, to RCA Corporation. Operation of memory array employing variable threshold transistors. 3,713,111, Cl. 340-173.00r.

Ross, Francis Joseph, to Du Pont de Nemours, E. I., and Company. Production of sodium. 3,712,858, Cl. 204-68.000.

Ross, Milton Dean: *See—*
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Rossetti, Oliver Gabriel. Trimming apparatus. 3,712,166, Cl. 83-455.000.

Rothermel, Heinz. Chair height control. 3,712,574, Cl. 248-409.000.

Rothschild, Barbara G. Safety belt system for motor vehicles. 3,712,401, Cl. 180-82.000.

Rott, Vernon: *See—*
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Royal Industries, Inc.: *See—*
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Ruffle, William H.; and Hemsley, Brian C., said Hemsley assor. to Dugard, C., Limited. Battery power control device. 3,712,399, Cl. 180-19.00r.

Ruggeri, Joseph P. Weapon handling apparatus. 3,712,567, Cl. 244-137.00r.

Rumpelein, Fritz: *See—*
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Russ, Edwin. Cup holder. 3,712,235, Cl. 108-46.000.

Russell, Kenneth M. Modification means for changing wheeled vehicles to all-terrain vehicles. 3,712,688, Cl. 305-34.000.

Russell, Larry Rayner: *See—*
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Russell, Lewis K.: *See—*
Allison, David F.; and Russell, Lewis K., 3,711,940.

Ruth, Arthur P., 50% to Smith, Dalton L. Internal combustion engine incorporating modification to reduce pollution in exhaust therefrom. 3,712,281, Cl. 123-119.00a.

Rysdam, John E., II. Extensible bunk stake for log trucks. 3,712,639, Cl. 280-146.000.

S. & C. Electric Company: *See—*
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Safetech, Inc.: *See—*
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Sahrbacker, Edward V., to Lucerne Products, Inc. Rotary actuator for a switch. 3,713,070, Cl. 338-198.000.

Sailers, Young T. Apparatus for smoke control. 3,712,041, Cl. 55-228.000.

Sakai, Takeyo: *See—*
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Sakakibara, Naoji: *See—*
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Sakamoto, Kazuo; and Tamura, Ryoji, to Nippon Electric Company, Limited. Injection type frequency locked oscillator apparatus. 3,713,041, Cl. 331-44.000.

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Sands, Ovie L., to AMF Incorporated. Self-compensating railway hand brake linkage. 3,712,146, Cl. 74-491.000.

Sanford, Norman R.; and Vikmanis, Juris, to Bendix Corporation. Apparatus and method of determining displacements. 3,713,139, Cl. 340-347.00p.

Sansom, William; and Thompson, Fred W., to Du Pont de Nemours, E. I., and Company. Heat shield for chemical waste incinerator. 3,712,796, Cl. 23-277.00c.

Santa Cruz, Leon M. Anti-smog and exhaust device. 3,712,031, Cl. 55-223.000.

Santa-Maria, Enrique, to Compagnie Generale d'Electricite. Controlled change-over super conductive switch. 3,713,058, Cl. 335-216.000.

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Schacher, Willi; and Schneider, Rudolf, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Electromagnetically operable friction clutch. 3,712,439, Cl. 192-84.00c.

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Schepartz, Abner I. Penholder for chart recorders. 3,713,171, Cl. 346-139.00c.

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Schillinger, Joseph F., to U.S. Plywood-Champion Papers, Inc. Shadow box for tube. 3,712,461, Cl. 206-45.190.

Schippers, Heinz; and Hensen, Friedheim, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Vented screw extruder with pressure and flow regulating means. 3,712,594, Cl. 259-191.000.

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Schmier, Jacob, to Rodale Manufacturing Company, Inc. Molding press. 3,712,781, Cl. 425-161.000.

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Schoch, Robert, to Weinmann Aktiengesellschaft. Shoe closure device especially for ski shoes. 3,711,900, Cl. 24-68.0sk.

Schock, Julius, to Werkzeugmaschinenfabrik Oerlikon Buhrle AG. Missile having a casing and containing secondary projectiles. 3,712,229, Cl. 102-69.000.

Schoellkopf, Ulrich; and Gerhart, Fritz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Metallized isocyanides. 3,712,911, Cl. 260-465.000.

Schoenwald, Goenter. Portable dump box. 3,712,675, Cl. 298-10.000.

Schon, Nikolaus; Schnoring, Hildegard; Witte, Josef; and Pampus, Gottfried, to Bayer Aktiengesellschaft. Process for the production of microcapsules with the aid of synthetic coacervates and microcapsules produced thereby. 3,712,867, Cl. 252-316.000.

Schrader, Gerhard; and Hammann, Ingeborg, to Farbenfabriken Bayer Aktiengesellschaft. S-(1,3-Dihalo-prop-2-yl-mercaptomethyl)-thiol and thionothiol phosphoric and phosphonic acid esters. 3,712,937, Cl. 260-948.000.

Schrader, Gerhard; Hammann, Ingeborg; and Stendel, Wilhelm, to Farbenfabriken Bayer Aktiengesellschaft. β-Phenylethyl esters of alkyl-O-phenylthiolphosphonic acids. 3,712,938, Cl. 260-949.000.

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Semon, Albert L. Fluid pressure compensating regulator. 3,712,333, Cl. 137-498.000.

Senak, Peter, Jr., to Superior Electric Company, The. Method of minimizing error in incremental whole unit positioning from data having fractional units. 3,713,172, Cl. 444-1.000.

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Smith, Michael John Stapley; Wilson, John Henry; and Parr, Bryan Reginald, to United Kingdom Atomic Energy Authority. Apparatus for performing the immiscible refrigerant freeze process for purifying water. 3,712,075, Cl. 62-123.000.
Smith, Robert C., to Geigy Chemical Corporation. Computer controlled dichloro reaction system. 3,712,976, Cl. 235-151.120.
Smith, Robert L., to Garrett Corporation, The. Antifriction bearing spacer. 3,712,694, Cl. 308-199.000.
Smith, Warren K., to United States of America, Navy. Heat flux indicator. 3,712,131, Cl. 73-190.00h.
Smithe, F. L., Machine Company, Inc.: *See—*
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Smoak, Benjamin G. Post driver. 3,712,389, Cl. 173-126.000.
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Snider, John H., Jr.; and Snider, Harold H. Lather producing machine. 3,712,512, Cl. 222-67.000.

Snowdon, Charles; and Redhead, Robert Gonne, to National Research Development Corporation. Medical treatment apparatus. 3,712,298, Cl. 128-40.000.

Snyder, Kenneth E., to General Motors Corporation. Hydraulic clutch with centrifugal and manual valves. 3,712,437, Cl. 192-103.0fa.

Societe Anonyme D.B.A.: *See—*
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Societe Anonyme Francaise du Ferodo: *See—*
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Societe Financiere Francaise de Licences et Brevets: *See—*
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Sorrenti, Angelo. Internal combustion jet engine. 3,712,060, Cl. 60-269.000.

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Sparks, William J. Hand grips. 3,712,343, Cl. 138-177.000.

Spear, Gilmore M., to Gleason Works, The. Method for lapping gears. 3,712,000, Cl. 51-287.000.

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Staats, William A.; Bosley, Denis V.; Cook, John S.; and Yamasaki, Toshio, to Mattel, Inc. Multiple toy vehicle lap counter. 3,712,615, Cl. 273-86.00r.

Stamets, Melvin W.; and Clauss, Charles E. Mechanism for ejecting plastic materials. 3,712,516, Cl. 222-326.000.

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Staschke, Marvin A.; and Kryczko, Henry, to Thermal Hydraulics Corporation. Thermal actuator with captive piston shaft and special seal. 3,712,052, Cl. 60-23.000.

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Stettner, Joseph C., to Novar Electronics Corporation. Burglar deterrent timing switch. 3,713,126, Cl. 340-258.00d.

Steudel, Goetz Wolfgang, to RCA Corporation. Input transient protection for complementary insulated gate field effect transistor integrated circuit device. 3,712,995, Cl. 307-304.000.

Steves, Leon F. Launching device for boat trailers. 3,712,488, Cl. 214-82.000.

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Stichting Ontwikkeling Verpakkingsmethoden in de Zuivelindustrie: *See—*
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Stoll, Milton. Method and apparatus for sealing. 3,711,939, Cl. 29-494.000.

Stoloff, Charles I. Device for elevating and supporting bifocal spectacles. 3,712,717, Cl. 351-55.000.

Stommel, Charles J.; and Hamilton, William F. Winding apparatus. 3,712,155, Cl. 74-810.000.

Stone, Charlie J.; and Stone, Joseph S. Leveling device. 3,712,570, Cl. 248-133.000.

Stone, David W., to Harnischfeger Corporation. Digital to analog converter. 3,713,137, Cl. 340-347.0da.

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Strand, Lewis. Lifting yoke for transport containers. 3,712,661, Cl. 294-67.0da.

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Streeter, Daniel D., Jr. Reinforcement mat for tire. 3,712,361, Cl. 152-356.000.

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Strycker, Stanley J., to Dow Chemical Company, The. Phenoxaphosphinic acid derivatives. 3,712,935, Cl. 260-936.000.
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Stubblefield, Maurice. Horse or the like shoe device. 3,712,382, Cl. 168-22.000.
Stucki, Frank F., to United States of America, Air Force. Magnetic and pressure transducer. 3,712,142, Cl. 73-389.000.
Students, John J., to Wiss, J., and Sons Co. Removable handles for shears of the like. 3,711,950, Cl. 30-341.000.
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Swarner, William G.; and Prettyman, Clinton E., to United States of America, Navy. Optical spatial filter for modification of received energy VS range. 3,712,985, Cl. 250-216.000.
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Takagi, Nobuo; and Kuroyanagi, Rikuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Friction welding apparatus having means for continuously regulating heat generated during welding operation. 3,712,528, Cl. 228-2.000.
Takahashi, Katsushi. Pan transfer device for baking oven. 3,712,452, Cl. 198-34.000.
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Taylor, James A. Golfers head movement reminder device. 3,712,625, Cl. 273-190.00r.
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Terlinde, Donald J. Fret board for stringed instruments. 3,712,952, Cl. 84-314.000.
Teske, Fritz; and Teske, Lothar. Support roller for conveyor belts and the like. 3,711,912, Cl. 29-116.00r.
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Theer, Anton, to Agfa-Gevaert A.G. Cinematographic apparatus with reversible film transporting means. 3,712,560, Cl. 242-205.000.
Theimer, Ernst Theodore, to International Flavors & Fragrances Inc. Compositions containing coumarin ether sun-screening compounds. 3,712,947, Cl. 424-59.000.
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Toth, Alex, to Ellis Corporation. Commercial laundry machine and releasable connections therefor. 3,712,089, Cl. 68-210.000.
Toth, Alex; and Fesmire, Robert H., to Ellis Corporation. Laundry machine and loading structure therefor. 3,712,090, Cl. 68-210.000.
Townsend, Almon F., to Persons-Majestic Mfg. Company. Cycle stand. 3,712,637, Cl. 280-293.000.
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Van Popta, Yftinus Frederik, to N.V. Hollandse Signaalapparaten. Pulse radar system for detecting moving targets. 3,713,153, Cl. 343-7.700.
Van Thyne, Ray J.; and Rausch, John J., to Surface Technology Corporation. Chromium boride coated articles. 3,712,798, Cl. 29-195.00a.
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Weichbrodt, Bjorn; and Darrel, Bernard, to General Electric Company. Detection of distributed defects in gear assemblies. 3,712,130, Cl. 73-162.000.
Weimann, Gunter; Haid, Erich; Muhlegger, Klaus; Bergmeyer, Hans Ulrich; Dietmann, Karl; Michal, Gerhard; and Nelboeck-Hochstetter, Michael. Purine-ribofuranoside-3',5'-cyclo-phosphates and process for their preparation. 3,712,885, Cl. 260-211.50r.
Weimar, Peter: *See—*
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Weinstein, Aaron; and Scourtas, Frank, to Pacesetter Products, Inc. Shoe stiffener and method of using the same. 3,711,969, Cl. 36-68.000.
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Weiss, Efram I. Heated article of apparel. 3,712,288, Cl. 126-206.000.
Weissauer, Hermann, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 5-anthraquinonyl (1) amino-thiadiazoles. 3,712,901, Cl. 260-303.000.
Weissenberg, Ulrich W., to Dow Chemical Company, The. Regeneration of caustic liquor for etching aluminum. 3,712,838, Cl. 156-19.000.
Welch, Arthur L. Transmission. 3,712,154, Cl. 74-688.000.
Wenner, William S.; Stuhlmuller, Brian J.; Bouloutian, Ara; and Zakarian, Paul. Device which scans and detects for contents in a package. 3,712,468, Cl. 209-88.000.
Wennerblom, Bengt Axel; Udden, Per Edward Carl; Udden, Anna Britt; and Lindgren, Ivar, to Svenska Cellulosa Aktiebolaget. Tampon for taking up menstrual liquids. 3,712,305, Cl. 128-285.000.
Wentz, John L., to Westinghouse Electric Corporation. Q-switching laser system having electronically controlled output coupling. 3,713,032, Cl. 331-94.500.
Werkzeugmaschinenfabrik Oerlikon Buhrle AG: *See—*
Schock, Julius, 3,712,229.
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Leonhardt, Joseph H., Jr.; Lunsford, Jack I., Jr.; Sharpe, Bynum B.; and Templin, Charles T., 3,711,926.
Westersten, Allan S., to Statham Instruments, Inc. Flowmeter probe. 3,712,133, Cl. 73-194.0em.
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Wheel Trueing Tool Company of Canada, Ltd.: *See—*
Dela Gorgendiere, Choiseul J. J., 3,712,392.
White, James C.; and Emge, Gene F., to Koehring Company. Traveling mold mechanism for forming plastic articles. 3,712,771, Cl. 425-126.000.
Whitman, Robert J.: *See—*
Letson, George M.; Whitman, Robert J.; and Scott, James J., Jr., 3,713,021.
Whitney, Eugene C., to Westinghouse Electric Corporation. Dynamoelectric machine with differential protection system including means for air gap monitoring. 3,713,002, Cl. 317-13.00r.
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Whittaker, Gary L., to Xerox Corporation. Reversal development. 3,712,728, Cl. 355-10.000.
Whittemore, Dwight S.: *See—*
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Wickman Machine Tool Sales Limited: *See—*
Mason, Peter Alan, 3,711,998.
Widmer, Karl; and Zumsteg, Horst, to Schweizerische Aluminum AG. Device for the testing of seams of foil or sheet sealed containers. 3,712,112, Cl. 73-37.000.
Wiebe, Jacob R. Car wash system. 3,712,335, Cl. 137-599.000.
Wiese, Harold H., to United States of America, Army. Link-seal unit for caseless ammunition. 3,712,172, Cl. 89-17.000.
Wiesenhofer, Frank H.: *See—*
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Wightman, Lawrence W.; and Long, Thomas J., to Emerson Electric Co. Drill chuck with cemented aligning bushing. 3,712,632, Cl. 279-1.001.
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Williams, James Edgar, to Bell Telephone Laboratories, Incorporated. Tape reel hold down mechanism. 3,712,561, Cl. 242-68.300.
Williams, Robert Ernest: *See—*
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Williams, Victor E. Crazy tires. 3,712,359, Cl. 152-352.000.
Wilmans, Stephen C. Paint applicator. 3,712,748, Cl. 401-197.000.
Wilson, Jack: *See—*
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Greene, Harry A., Jr.; and Wing, Charles, 3,712,297.
Winkel Machine Company, Inc.: *See—*
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Winkler, Alfred; Winkler, Friedrich; Neudecker, Karl; and Zanner, Johann, Jr., to Agfa-Gevaert Aktiengesellschaft. Motion picture camera with fading means. 3,712,720, Cl. 352-91.000.
Winkler, Friedrich: *See—*
Winkler, Alfred; Winkler, Friedrich; Neudecker, Karl; and Zanner, Johann, Jr., 3,712,720.
Winkler, Robert, to Escher Wyss Limited. Process for evaporating NaCl brine to separate NaCl crystals from Na_2SO_4. 3,712,797, Cl. 23-296.000.
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Nathansohn, Giangiacomo; Aresi, Vanna; and Winters, Giorgio, 3,712,897.
Winters, Theron C. Fishing accessory and method. 3,711,985, Cl. 43-25.200.
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Wise, Eugene H.; and Galt, Homer W., to R & G Sloane Manufacturing Company, Inc. Valve and method of making same. 3,712,584, Cl. 251-162.000.
Wiss, J., and Sons Co.: *See—*
Students, John J., 3,711,950.
Witte, Josef: *See—*
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Wolber, Robert; and Assmus, Friedrich, to Gebruder Jughans G.m.b.H., Firma. Electric clock mounting and contact apparatus. 3,712,044, Cl. 58-23.00r.
Wolf, John P., III: *See—*
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Wolgast, Raymond P.: *See—*
Holsapple, Olen Wade; Holsapple, Edward Joe; and Holsapple, Jerry Raymond, 3,712,106.
Wong, Cho Lun; Jones, Glenson Trevelyn; and Crawford, Roland Francis, to Northern Electric Company Limited. Waveform generator with accurate mark to space ratio. 3,713,046, Cl. 331-111.000.
Wong, Stephen; Wright, Louis J.; and Barleen, David G., to Systron-Donner Corporation. Vault alarm system and method. 3,713,128, Cl. 340-261.000.
Woodham, George W.; and Stuart, James L., to Dart Industries, Inc. Apparatus for the continuous production of glass fiber reinforced thermoplastic. 3,712,776, Cl. 425-202.000.
Woods, Kenneth K.: *See—*
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Wortel, Johannes M.: *See—*
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Dwyer, Francis Bosworth; Thompson, Richard Lawrence; and Wulff, Eberhard, 3,712,469.
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Yale, Harry L., to Squibb, E. R., & Sons, Inc. α,α,α,α',α'-Hexafluorodi- -tolylamine derivatives. 3,712,921, Cl. 260-570.50p.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
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Yamamoto, Hiroshi, to Shimadzu Seisakusho Ltd. Illuminator system for use in spectrophotometer. 3,712,738, Cl. 356-93.000.
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Yamasaki, Toshio; Cook, John S.; and Staats, William A., to Mattel, Inc. Track system for toy vehicles. 3,712,540, Cl. 238-10.00e.
Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshi; Kawanishi, Masazumi; Sato, Masanori; and Nagao, Taku, to Tanabe Seiyaku Co., Ltd. 1-Cyclohexylmethyl-6-hydroxy-1,2,3,4-tetrahydroisoquinoline. 3,712,895, Cl. 260-289.00r.
Yaresh, Frank S. Golf ball retrieving. 3,712,658, Cl. 294-19.00a.
Yates, John; and Payne, David H., to Shell Oil Company. Weed control employing N,N-disubstituted amino acid herbicides. 3,712,805, Cl. 71-115.000.
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Yoshimura, Hirofumi, to Kabushiki Kaisha Yashica. Camera shutter. 3,712,194, Cl. 95-10.0ct.
Young, Donald Marion, to Amsted Industries Incorporated. Bolster snubber wear plate. 3,712,247, Cl. 105-197.0db.
Young, James Douglas: *See—*
Owen, Harrold D.; Rosenthal, Wayne O.; and Young, James Douglas, 3,712,376.
Yves, Correia; and Rene, Clair, to Produits Chimiques Pechiney-Saint Gobain. Process of decomposition of 1,1,1,2-tetrachloroethane. 3,712,869, Cl. 252-407.000.
Zacharias, Jerrold R.: *See—*
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Zadow, Dale W.: *See—*
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Zaky, Amin Y., to Stromberg-Carlson Corporation. Frequency ringing test trunk circuit. 3,712,963, Cl. 179-175.20b.
Zanner, Johann, Jr.: *See—*
Winkler, Alfred; Winkler, Friedrich; Neudecker, Karl; and Zanner, Johann, Jr., 3,712,720.
Zanner, Johann, Jr., to Agfa-Gevaert Aktiengesellschaft. Projector for use with magazines and reels for motion picture film. 3,712,719, Cl. 352-73.000.
Zavod, Pierce H., to United States of America, Navy. Water level indicator. 3,712,137, Cl. 73-295.000.
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Zenith Radio Corporation: *See—*
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Syster, Gerald T., 3,712,699.
Zenk, William Edward, to Procter & Gamble Company, The. Textile treating compositions which aid in the removal of soil from polyester and polyamide synthetic textile materials. 3,712,873, Cl. 260-29.20e.
Zentmeyer, John E., Jr., to Lafley, Karen V. Method and apparatus for producing swept frequency-modulated audio signal patterns for inducing sleep. 3,712,292, Cl. 128-1.00c.
Ziegler, Douglas G.; and Spurlock, Roy T., Jr. Fan-fold paper guides and stacking mechanisms. 3,712,607, Cl. 270-61.00f.
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Henrick, Clive A.; and Siddall, John B., 3,712,922.
Siddall, John B.; and Calame, Jean Pierre, 3,712,880.
Zorowski, Carl F.; and Calfee, John D., to Monsanto Company. Method of preparing metal foil/graphite fiber/ epoxy resin laminates. 3,711,934, Cl. 29-445.000.
Zucchini, Guido, to A.M.A. (Artigiana Meccanici Associati). Dry cleaning system for garments comprising a number of wash tanks connected into independent circuits utilizing different solvents. 3,712,087, Cl. 68-108.00c.
Zumsteg, Horst: *See—*
Widmer, Karl; and Zumsteg, Horst, 3,712,112.
Zundel, Arthur P., to National Can Corporation. Full open end closure. 3,712,503, Cl. 220-54.000.
Zurn Industries, Inc.: *See—*
Anderson, Norman J.; and Decker, John L., 3,712,434.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF JANUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Achener, Claude, to Quartz & Silice, S.A. Devitrification of the core of a coaxial glass fiber. Re. 27,560, 1–23–73, Cl. 65—3.

Adaptronics, Inc.: *See*—
Barron, Roger L. Re. 27,561.

Barron, Roger L., to Adaptronics, Inc. Self-organizing control system for providing muitiple-goal, multiple-actuator control. Re. 27,561, 1–23–73, Cl. 340—172.5.

Baumgardner, Arthur R., R. P. Johnston, and W. R. Martini, to McDonnell Douglas Corp. Stirling cycle machine with self-oscillating regenerator. Re. 27,567, 1–23–73, Cl. 290—1.

Botefuhr, Harold R., to McGraw-Edison Co. Radial arm saw. Re. 27,565, 1–23–73, Cl. 143—6.

Corrsin, Lester, to Curtis Instruments, Inc. Operating time indicator. Re. 27,556, 1–23–73, Cl. 324—182.

Curtis Instruments, Inc.: *See*—
Corrsin, Lester. Re. 27,556.

Dualjet Corp.: *See*—
Simons, Edward W. Re. 27,566.

Etter, William A., and W. L. Seaman, to Fisher Controls Co., Inc. Filler valve. Re. 27,564, 1–23–73, Cl. 137—512.3.

Fisher Controls Co., Inc.: *See*—
Etter, William A., and Seaman. Re. 27,564.

Hughes Aircraft Co.: *See*—
Lian, Kenneth T. Re. 27,557.
Wendland, Paul H. Re. 27,559.

Johnston, Richard P.: *See*—
Baumgardner, Arthur R., Johnston, and Martini. Re. 27,567.

Lian, Kenneth T., to Hughes Aircraft Co. Sequential switching circuit breaker for high power AC or DC power transmission circuits. Re. 27,557, 1–23–73, Cl. 317—11.

Little, Carl H.: *See*—
Phelps, Malcolm T., and Little. Re. 27,558.

Martini, William R.: *See*—
Baumgardner, Arthur R., Johnston, and Martini. Re. 27,567.

McDonnell Douglas Corp.: *See*—
Baumgardner, Arthur R., Johnston, and Martini. Re. 27,567.

McGraw-Edison Co.: *See*—
Botefuhr, Harold R. Re. 27,565.

Phelps, Malcolm T., and C. H. Little, to Weber-Knapp Co. Platform elevation control mechanism. Re. 27–558, 1–23–73, Cl. 312—272.

Quartz & Silice, S.A.: *See*—
Achener, Claude. Re. 27,560.

Roosa, Vernon D., to Stanadyne, Inc. Fuel pump. Re. 27,563, 1–23–73, Cl. 417—462.

Seaman, Wendell L.: *See*—
Etter, William A., and Seaman. Re. 27,564.

Simons, Edward W., to Dualjet Corp. Air conditioned display compartment and method. Re. 27,566, 1–23–73, Cl. 62—89.

Smith, Joseph E., to Wolverine-Pentronix, Inc. Powder compacting press. Re. 27,562, 1–23–73, Cl. 425—78.

Stanadyne, Inc.: *See*—
Roosa, Vernon D. Re. 27,563.

Weber-Knapp Co.: *See*—
Phelps, Malcolm T., and Little. Re. 27,558.

Wendland, Paul H., to Hughes Aircraft Co. Image transducing system employing reverse biased junction diodes. Re. 27,559, 1–23–73, Cl. 315—10.

Wolverine-Pentronix, Inc.: *See*—
Smith, Joseph E. Re. 27,562.

LIST OF DESIGN PATENTEES

Alaska, St. Barth. Combined magnifying glass and bottle stopper. 226,070, 1–23–73, Cl. D9—261.

Allstar Verbrauchsguter GmbH & Co. KG.: *See*—
Krusche, Kurt, and Zimmermann. 226,141.

Amdek Corp.: *See*—
Melanson, Leonard L. 226,149.

American Seating Co.: *See*—
Bareeki, Chester J. 226,066.

Anchor Hocking Corp.: *See*—
Nixdorff, Frank, Jr. 226,054.

Andamasaris, Judith E. Scoop and dispenser device for game chips. 226,119, 1–23–73, Cl. D34—13.

Anderson, George A., and E. H. McCauley, to Docutel Corp. Banking machine terminal. 226,088, 1–23–73, Cl. D26—5.

Bally Mfg. Corp.: *See*—
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Bareeki, Chester J., to American Seating Co. Combined seat and table. 226,066, 1–23–73, Cl. D6—42.

Barnett, Joe R.: *See*—
Forsty, William A., and Barnett. 226,087.

Baron, Arthur: *See*—
Weatherell, James W., Baron, and Chesner. 226,122.

Beall, Lester, Jr. Sling chair. 226,052, 1–23–73, Cl. D6—66.

Bellasalma, Gerald J., to Plastetics Inc. Frame front for merchandising machine. 226,132, 1–23–73, Cl. D52—3.

Berry, Maxwell. Bird feeder. 226,098, 1–23–73, Cl. D30—14.

Bixler, Kenneth D.: *See*—
Reifers, Richard F., and Bixler. 226,053.

Bock, John W. Airplane, 226,136, 1–23–72, Cl. D71—1.

Boise Cascade Corp.: *See*—
Westphal, Teddy M. 226,073.

Boroszewski, John A. Wall plaque. 226,085, 1–23–73, Cl. D29—23.

Brack, Robert M. Trophy. 226,091, 1–23–73, Cl. D29—28.

Brainerd, Andrew W., K. H., and S. W. Shoe cleaning-polishing device. 226,142, 1–23–73, Cl. D86—11.

Brainerd, Andrew W., K. H., and S. W. Shoe cleaning-polishing device. 226,143, 1–23–73, Cl. D86—11.

Brainerd, Andrew W., K. H., and S. W. Shoe cleaning-polishing device. 226,144, 1–23–73, Cl. D86—11.

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Braun Aktiengesellschaft: *See*—
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British Domestic Appliances Ltd.: *See*—
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Campbell, Laurie J.: *See*—
Smith, James, and Campbell. 226,103.

Campbell, Thomas L.: *See*—
Moon, William I., and Campbell. 226,075.

Challenge-Cook Bros., Inc.: *See*—
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Chesner, Francis R.: *See*—
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Clair Mfg. Co., Inc.: *See*—
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111 3,712,821
209 3,712,822
214 3,712,823
349 3,712,207
373 3,712,208
400 3,712,819

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93C 3,712,210
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219 3,712,215
232 3,712,214
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23 3,712,220
24HC 3,712,221
27R 3,712,222
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37.6 3,712,224
38 3,712,225
49.3 3,712,226
49.7 3,712,227
60 3,712,228
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70.2 3,712,218
79 3,712,231
85.2 3,712,232
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93 3,712,236
99 3,712,237
130 3,712,238
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148LM 3,712,240
172S 3,712,241
279 3,712,242

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164 3,712,245
196 3,712,246
197DB 3,712,247
253 3,712,248
282R 3,712,249
360 3,712,250
409 3,712,251

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308M 3,712,824

CLASS 108

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CLASS 112

113 3,712,253
121.29 3,712,254
252 3,712,255
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230 3,712,260
235F 3,712,261

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33.5R 3,712,827
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125 3,712,830
144 3,712,831

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18 3,712,267
37 3,712,268
51 3,712,269
61 3,712,270
96 3,712,271

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8.49 3,712,274
32EA 3,712,275
47R 3,712,276
90.22 3,712,277
90.39 3,712,278
117A 3,712,279
119CB 3,712,280
119CD 3,712,282
119A 3,712,281
179A 3,712,283

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391 3,712,289

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1D 3,712,290
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2.05Q 3,712,297
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218A 3,712,301
221 3,712,302
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CLASS 132
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167R 3,712,313

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1A 3,712,315
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78 3,712,327
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3,712,322
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3,712,324
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234.5 3,712,328
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355.16 3,712,331
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498 3,712,333
512.3 Re.27,564
560 3,712,314
587 3,712,334
597 3,712,325
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613 3,712,336
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625.41 3,712,338
625.62 3,712,339
627.5 3,712,340

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46 3,712,342
145 3,712,317
177 3,712,343

CLASS 139
11 3,712,344
125 3,712,345

CLASS 140
123.6 3,712,346

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CLASS 143
6A Re.27,565
133M 3,712,349

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28.72 3,712,351
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11.5R 3,712,837

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CLASS 151
2 3,712,355
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41.73 3,712,357

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208 3,712,358
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354 3,712,360
356 3,712,361
361 3,712,362

CLASS 156
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66 3,712,840
144 3,712,841
321 3,712,832
427 3,712,839
464 3,712,842
499 3,712,843

CLASS 160
113 3,712,363

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38 3,712,844
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43 3,712,846
55 3,712,847
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218 3,712,849

CLASS 164
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52 3,712,365
87 3,712,366
275 3,712,367
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CLASS 165
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163 3,712,371
170 3,712,372

CLASS 166
232 3,712,373
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252 3,712,377
277 3,712,376
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299 3,712,378
300 3,712,380

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CLASS 172
264 3,712,383
796 3,712,384

CLASS 173
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46 3,712,386
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78 3,712,388
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132 3,712,390

CLASS 174
99B 3,712,953

CLASS 175
26 3,712,391
65 3,712,393
269 3,712,854
325 3,712,392

CLASS 176
19R 3,712,850
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CLASS 177
1 3,712,394
210 3,712,395

CLASS 178
5.4BD 3,712,954
6.6A 3,712,956
6.6R 3,712,955
6.8 3,712,957
7.8 3,712,958

CLASS 179
1VC 3,712,959
6R 3,713,039
90BB 3,712,960
100.1DR 3,712,961
107R 3,712,962
175.2B 3,712,963
189R 3,712,964

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6.2 3,712,397
6.48 3,712,403
9.48 3,712,398
19R 3,712,399
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82 3,712,401
104 3,712,405
122 3,712,406

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.5BM 3,712,407
.5RM 3,712,410
.5H 3,712,408
.5S 3,712,414
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31B 3,712,411
33GE 3,712,413
33D 3,712,412
35A 3,712,416
60 3,712,415

CLASS 182
48 3,712,417
92 3,712,418
107 3,712,419

CLASS 184
103R 3,712,420

CLASS 185
37 3,712,421

CLASS 188
72.3 3,712,422
73.5 3,712,423
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79.5GE 3,712,425
164 3,712,426
251A 3,712,427
3,712,428
300 3,712,429

CLASS 191
45R 3,712,430

CLASS 192
12B 3,712,431
26 3,712,432
28 3,712,433
53E 3,712,434
70.27 3,712,435
84C 3,712,439
89B 3,712,436
103FA 3,712,437
105CD 3,712,438

CLASS 194
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97 3,712,441

CLASS 195
103.5R 3,712,853

CLASS 197
2 3,712,442
84A 3,712,443
100 3,712,444
133R 3,712,445
175 3,712,446

CLASS 198
16MS 3,712,448
16 3,712,447
20R 3,712,449
25 3,712,450
33AD 3,712,451
34 3,712,452
41 3,712,453
127R 3,712,454
165 3,712,455
175 3,712,456
208 3,712,457
219 3,712,458
220A 3,712,459
221 3,712,460

CLASS 200
17R 3,712,965
38R 3,712,966
61.06 3,712,967
61.56 3,712,968
148R 3,712,969
164R 3,712,970

CLASS 201
6 3,712,855

CLASS 204
29 3,712,856
67 3,712,857
68 3,712,858
180G 3,712,859
195W 3,712,860

CLASS 206
45.19 3,712,461
65R 3,712,463
65S 3,712,464
72 3,712,465

CLASS 208
216 3,712,861

CLASS 209
73 3,712,466
88 3,712,468
110.5 3,712,467
111.7 3,712,469

CLASS 210
61 3,712,470
107 3,712,471
222 3,712,472
321 3,712,473
3,712,474
3,712,475
387 3,712,476

CLASS 211
40 3,712,477

CLASS 212
89 3,712,478

CLASS 213
47 3,712,479

CLASS 214
1CM 3,712,481
1Q 3,712,480
1R 3,712,482
6BA 3,712,483
3,712,487
6S 3,712,486
16.1ED 3,712,485
82 3,712,488
83.36 3,712,489
138C 3,712,490
505 3,712,491
511 3,712,496
515 3,712,493
518 3,712,492
519 3,712,494
520 3,712,495

CLASS 215
1C 3,712,497
38R 3,712,498

CLASS 217
12 3,712,499

CLASS 219
10.55 3,712,971
267 3,712,972

CLASS 220
9LG 3,712,500
20 3,712,502
54 3,712,503
84 3,712,504
85R 3,712,501
111 3,712,505

CLASS 221
11 3,712,506
82 3,712,507
141 3,712,508
197 3,712,509
260 3,712,510

CLASS 222
52 3,712,511
67 3,712,512
134 3,712,513
146C 3,712,514
182 3,712,515
326 3,712,516
402.13 3,712,517
561 3,712,518
563 3,712,519

CLASS 223
34 3,712,520
107 3,712,521

CLASS 224
29R 3,712,522
42.1E 3,712,523
42.1H 3,712,524
45T 3,712,525

CLASS 226
97 3,712,526
136 3,712,527

CLASS 228
2 3,712,528
44 3,712,529

CLASS 229
4.5 3,712,530
40 3,712,531
44R 3,712,532
51BP 3,712,534
51TC 3,712,533

CLASS 230
177 3,712,544

CLASS 233
3 3,712,535

CLASS 235
61.11R 3,712,973
70R 3,712,974
151.12 3,712,976
152 3,712,536
3,713,026
153 3,712,537
195 3,712,977

CLASS 238
10E 3,712,538
3,712,539
3,712,540
3,712,541

CLASS 239
2R 3,712,542
102 3,712,543
233 3,712,545
265.11 3,712,546
265.39 3,712,547
428.5 3,712,548

CLASS 240
1.3 3,712,978
41.35R 3,712,979
47 3,712,980
51.12 3,712,981

CLASS 241
19 3,712,549
27 3,712,353
41 3,712,550
88 3,712,551

CLASS 242
55.19A 3,712,552
56R 3,712,553
56.2 3,712,554
68.3 3,712,561
72 3,712,555
100 3,712,556
195 3,712,558
197 3,712,557
199 3,712,559
205 3,712,560

CLASS 244
3.15 3,712,562
3.17 3,712,563
41 3,712,564
110G 3,712,565
117A 3,712,566
137R 3,712,567
148 3,712,568

CLASS 248
125 3,712,569
133 3,712,570
183 3,712,571
354R 3,712,572
394 3,712,573
409 3,712,574

CLASS 249
91 3,712,575
192 3,712,576

CLASS 250
83.6R 3,712,983
86 3,712,984
216 3,712,985
227 3,712,986

CLASS 251
23 3,712,577
35 3,712,578
38 3,712,579
96 3,712,580
129 3,712,581
134 3,712,582
149.4 3,712,583
162 3,712,584
174 3,712,585
285 3,712,587

CLASS 252
8.55E 3,712,862
3,712,863
28 3,712,864
312 3,712,865
316 3,712,866
3,712,867
321 3,712,868
407 3,712,869

CLASS 254
1 3,712,586
78 3,712,588

CLASS 256
13.1 3,712,589
34 3,712,590

CLASS 259
4 3,712,591
108 3,712,592
148 3,712,593
191 3,712,594

CLASS 260
2A 3,712,870
22XA 3,712,871
23EP 3,712,875
23.7N 3,712,872
29.2E 3,712,873
47R 3,712,462
69R 3,712,879
79.5B 3,712,878
80.7 3,712,876
87.7 3,712,877
158 3,712,881
187 3,712,882
209 3,712,883
210.5 3,712,884
211.5R 3,712,885
226 3,712,886
239.3A 3,712,887
240CA 3,712,888
240D 3,712,982
243R 3,712,889
247.7C 3,712,890
248C 3,712,891
251QB 3,712,892
268PH 3,712,893
270 3,712,894
289R 3,712,895
293.57 3,712,898
293.66 3,712,897
293.87 3,712,896
294.8F 3,712,899
3,712,906
295.5C 3,712,900
303 3,712,901
307A 3,712,902
308D 3,712,903
308R 3,712,904
309 3,712,909
309.7 3,712,905
326A 3,712,907
327C 3,712,908
332.5 3,712,920
397.5 3,712,910
408 3,712,880
410.9R 3,712,922
429.5 3,712,874
448A 3,712,923
464 3,712,911
465.3 3,712,912
470 3,712,913
471C 3,712,927
479C 3,712,914
3,712,915
484R 3,712,916
486R 3,712,917
501.11 3,712,918
512R 3,712,919
558A 3,712,924
3,712,925
561K 3,712,926
570.5P 3,712,921
592 3,712,928
612R 3,712,929
615B 3,712,930
653.7 3,712,931
857PI 3,712,932
3,712,933
876R 3,712,934
936 3,712,935
943 3,712,936
948 3,712,937
949 3,712,938

CLASS 261
114R 3,712,595

CLASS 263
6R 3,712,596
15R 3,712,597
32R 3,712,598
3,712,600
52 3,712,599

CLASS 266
37 3,712,601
41 3,712,602

CLASS 267
131 3,712,603
161 3,712,604

CLASS 269
14 3,712,605
92 3,712,606

CLASS 270
61F 3,712,607
79 3,712,610

CLASS 271
11 3,712,611
54 3,712,612
68 3,712,608
74 3,712,609

CLASS 272
58 3,712,613
85 3,712,614

CLASS 273
1R 3,712,616
75 3,712,618
86R 3,712,615
101 3,712,626
108 3,712,619
120R 3,712,620
3,712,621
128A 3,712,627
130R 3,712,622
153R 3,712,617
176FA 3,712,624
183B 3,712,623
190R 3,712,625
195A 3,712,628

CLASS 274
1A 3,712,629
10S 3,712,630

CLASS 277
207 3,712,631

CLASS 279
1L 3,712,632
58 3,712,633

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1.182 3,712,634
43.22 3,712,635
47.38 3,712,636
79.1 3,712,638
146 3,712,639
293 3,712,637
301 3,712,640
426 3,712,641
504 3,712,642

CLASS 282
29B 3,712,643

CLASS 285
39 3,712,644
95 3,712,645
315 3,712,646
318 3,712,647
321 3,712,648
397 3,712,649
405 3,712,650

CLASS 287
20.924 3,712,653
58CT 3,712,652

CLASS 289
2 3,712,654
17 3,712,651

CLASS 292
251 3,712,656
321 3,712,655

CLASS 293
86 3,712,657

CLASS 294
19A 3,712,658
57 3,712,659
61 3,712,660
67DA 3,712,661

CLASS 296
23R 3,712,662
24 3,712,663
102 3,712,664
137R 3,712,665

CLASS 297
61 3,712,666
140 3,712,667
162 3,712,668
188 3,712,669
195 3,712,670
258 3,712,671
306 3,712,672
452 3,712,673
456 3,712,674

CLASS 298
10 3,712,675
22R 3,712,676

CLASS 299
13 3,712,677
68 3,712,678
76 3,712,679

CLASS 301
63DS 3,712,680

CLASS 302
20 3,712,681
28 3,712,682

CLASS 303
6C 3,712,683
22A 3,712,684
52 3,712,685
71 3,712,686

CLASS 305
19 3,712,687
34 3,712,688
38 3,712,689

CLASS 307
41 3,712,987
221R 3,712,988
235 3,712,989
3,712,990
252F 3,712,991
267 3,712,992
3,712,993
293 3,712,994
304 3,712,995

CLASS 308
3.8 3,712,690
138 3,712,691
199 3,712,694
217 3,712,692
231 3,712,693

CLASS 310
247 3,711,907

CLASS 312
31 3,712,695
253 3,712,696
272 Re.27,558
297 3,712,697
350 3,712,698

CLASS 313
231 3,712,996
317 3,712,997

CLASS 315
10 Re.27,559
17 3,712,998
19 3,712,999
24 3,713,000
276D 3,713,001

CLASS 316
2 3,712,699
19 3,712,700
20 3,712,701

CLASS 317
11A Re.27,557
13R 3,713,002
18D 3,713,003
33R 3,713,004
3,713,005
101A 3,713,006
234R 3,713,007
235R 3,713,008

CLASS 318
6 3,713,009

CLASS 320
1 3,713,010

CLASS 321
15 3,713,018
27R 3,713,011
3,713,012
45R 3,713,013
69NL 3,713,014

CLASS 322
28 3,713,015
3,713,016

CLASS 324
32 3,713,021
51 3,713,019
3,713,020
60C 3,713,022
99D 3,713,023
146 3,713,024
182 Re.27,556

CLASS 325
58 3,713,025
308 3,713,027
392 3,713,028

CLASS 328
63 3,713,029

CLASS 330
4.3 3,713,030
16 3,713,031

CLASS 331
1A 3,713,040
44 3,713,041
94.5 3,713,032
3,713,042
3,713,043
3,713,044
109 3,713,045
111 3,713,046
116M 3,713,047
116R 3,713,033

CLASS 332
9R 3,713,017
31T 3,713,034
52 3,713,048

CLASS 333
7 3,713,049
24R 3,713,035
3,713,050
30R 3,713,036
73R 3,713,051
81A 3,713,037
82B 3,713,038
84R 3,713,052

CLASS 335
75 3,713,053
112 3,713,054
136 3,713,055
206 3,713,056
212 3,713,057
216 3,713,058
259 3,713,059

CLASS 336
58 3,713,060
70 3,713,061
192 3,713,066

CLASS 337
107 3,713,062
159 3,713,063
161 3,713,064
166 3,713,065
360 3,713,067

CLASS 338
2 3,713,068
32 3,713,069
198 3,713,070

CLASS 339
14R 3,713,071
17F 3,713,072
3,713,073
41 3,713,074
64R 3,713,075
91R 3,713,076
111 3,713,077
130C 3,713,078
217R 3,713,079
258R 3,713,080

CLASS 340
3E 3,713,081
3R 3,713,083
5R 3,713,082
7R 3,713,084
7 3,713,085
10 3,713,086
16R 3,713,087
17 3,713,088
18LD 3,713,089
27R 3,713,090
52A 3,713,091
58 3,713,092
62 3,713,093
66 3,713,094
146.1AB 3,713,095
146.3AC 3,713,098
146.3ED 3,713,097
146.3D 3,713,099
146.3Y 3,713,100
147R 3,713,101
152T 3,713,102
166R 3,713,103
3,713,104
3,713,105
172.5 Re.27,561
3,713,096
3,713,106
3,713,107
3,713,108
3,713,109
173AM 3,713,115
173RC 3,713,113
173SP 3,713,110
173R 3,713,111
3,713,112
3,713,114
174EB 3,713,117
3,713,120
174TF 3,713,116
3,713,119
174ZA 3,713,118
174.1E 3,713,121
174.1F 3,713,122
174.1G 3,713,123
209 3,713,124
224R 3,713,125
258D 3,713,126
261 3,713,127
3,713,128
267C 3,713,129
267R 3,713,130
273 3,713,132
279 3,713,131
280 3,713,133
324A 3,713,134
3,713,135
347DA 3,713,137
347DD 3,713,138
3,713,140
347NT 3,713,136
347SY 3,713,141
347P 3,713,139
408 3,713,142

CLASS 343
5R 3,713,143
3,713,144
6A 3,713,146
6.5R 3,713,148
6.8R 3,713,145
7A 3,713,147
3,713,149
7.3 3,713,150
7.5 3,713,151
7.7 3,713,152
3,713,153
9 3,713,154
16M 3,713,155
17 3,713,156
18 3,713,157
100SA 3,713,158
102 3,713,159
109 3,713,160
112CA 3,713,161
705 3,713,162
754 3,713,163
766 3,713,164
771 3,713,165
792 3,713,166
797 3,713,167

CLASS 346
74E 3,713,168
3,713,169
136 3,713,170
139C 3,713,171

CLASS 350
10 3,712,702
62 3,712,703
76 3,712,704
96WG 3,712,705
103 3,712,706
122 3,712,707
129 3,712,708
160R 3,712,709
160 3,712,710
164 3,712,711
247 3,712,712
276R 3,712,713
301 3,712,714
304 3,712,715

CLASS 351
7 3,712,716
55 3,712,717
160 3,712,718

CLASS 352
73 3,712,719
91 3,712,720
3,712,721
123 3,712,722

CLASS 353
19 3,712,723
25 3,712,724
68 3,712,725
3,712,726

CLASS 355
3 3,712,733
10 3,712,728
15 3,712,734
22 3,712,727
25 3,712,729
69 3,712,730
71 3,712,731
72 3,712,732
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54 : 3,712,587
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3,711,872
3,711,915
3,711,960
3,711,976
3,712,093
3,712,108
3,712,324
3,712,352
3,712,404
3,712,482
3,712,517
3,712,673
3,712,825
3,712,848
3,713,053
3,713,055
3,713,104
3,713,137
56 : 3,712,331

5	:	226,082			226,145	17	:	226,070	25	:	226,149
6	:	226,051			226,146			226,105	26	:	226,066
		226,055	8	:	226,077			226,142			226,099
		226,065			226,120			226,143			226,119
		226,089			226,140			226,144	27	:	226,062
		226,091	9	:	226,133	19	:	226,075			226,087
		226,107	11	:	226,069	20	:	226,057			226,126
		226,108			226,123			226,092	29	:	226,073
		226,109	12	:	226,074	21	:	226,150	34	:	226,129
		226,110			226,086			226,151			226,132
		226,116			226,093	22	:	226,083	36	:	226,053
		226,121	13	:	226,076	23	:	226,061			226,056
		226,131			226,080	24	:	226,054			226,085
		226,136			226,098			226,068			226,094
		226,138	16	:	226,060						

		226,095	42	:	226,058						
		226,101			226,103						
		226,111			226,112						
		226,114	46	:	226,122						
		226,117	48	:	226,088						
		226,134			226,096						
		226,135			226,097						
		226,148			226,113						
37	:	226,052			226,118						
39	:	226,079			226,147						
		226,104	51	:	226,081						
		226,130			226,100						
40	:	226,063	54	:	226,071						
		226,090			226,072						

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U. S. DEPARTMENT OF COMMERCE
Peter G. Peterson, Secretary

PATENT OFFICE
Robert Gottschalk, Commissioner